THE Soybean Digest

Official Publication

OF

THE AMERICAN SOYBEAN ASSOCIATION

VOLUME 5 • NUMBER 6 APRIL • 1945

APR 24 1945

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SOYBEAN INDUSTRY

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SKELLY BLDG., KANSAS CITY, MO.

THE Soybean Digest

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GEO. M. STRAYER, Editor KENT PELLETT, Managing Editor

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The American Soybean Association

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How to Boost Oil Supply

Statements coming out of Washington indicate that the fats and oils supply is going to become mighty short before it again becomes more abundant.

With lard production down 24 percent from last year, with butter supplies for domestic consumption skidding downward from 16.7 lbs. per capita to 10.5 lbs. for 1945, with soybean acreage scheduled for a reduction in the major soybean producing states, and with farm labor supplies and machinery quotas below last year's level, it seems to us that the ration points on edible fats and oils are destined to become rather numerous in coming months.

The European nations are going to need huge quantities of fats to tide them over until domestic production can be built up. Shipping space allocations for war needs will not permit extensive importation of tropical oils. We will have no alternative but to supply our own needs plus a portion of those of our allies. That can lead only to a more critical supply situation before belts can again be let out.

There are two suggestions which we believe worthy of attention. The first is proper inoculation of all soybean seed planted in 1945. That step alone might account for 10 to 20 million additional bushels of soybeans. Certainly it is to be urged, for the cost in time and effort is so extremely small.

The second suggestion is that of increased soybean acreage in those sections where wet weather and unfavorable field conditions have held back the seeding of small grains. No other crop adapted to American agricultural production will produce as many pounds of highly edible oil per acre as soybeans. Unless we are wrong we are going to need every pound of that oil before 1946 bows out. Now is the time to provide for it.

Somewhat Farfetched

National Provisioner breaks out into a cold sweat now and then over a fancied threat of soy food products to the meat industry. The following appeared in its pages February 24:

> "Those who advocate the substitution of any appreciable amount of soybeans for animal protein in the American diet would do well to consider the low level of health and energy of Chinese and Indian soybean eaters, according to Katherine Mitchell Johnson, former president of the American Dietetic Association, writing in *Food and Nutrition News* of the National Live Stock and Meat Board. According to her own observations in India, she says that "the man on the street, if he is not already sitting on the curb or sleeping in a doorway, is walking languidly. He looks as though he just got up and is searching for another place to lie down and rest . . . Running a modest apartment in Bombay requires at least six servants, all men, and all of them together not accomplishing the results of one efficient maid in the United States . . . Not only are the employes slow, but absenteeism runs very high. 'I was sick' or 'I just did not feel well' is the oft-repeated excuse."

Since India is not listed as a major soybean producing nation it is unlikely that soybeans form a substantial part of the diet of a very large number of the Indian

Modern Margarine

Modern U. S. pronunciation—*Mar'jar-in*

steps out . . .

NEW EDUCATIONAL PROGRAM

The National Association of Margarine Manufacturers has just launched an advertising campaign to tell the facts about Modern Margarine to consumers, physicians and home economists.

You, who also have a stake in Margarine, are also well aware that Margarine has made remarkable gains during the past three years.

We want to hold these gains.

You certainly want us to hold them.

You certainly want us to enlist public support in removing the unfair handicaps under which Margarine must operate today.

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Orientals Need Own Oil Crops

All countries will have to accept some new ideas if they are to get along together and make the wheels turn after the war. Freer world trade and lower trade barriers may be desirable in many cases.

But that does not mean we can bring on the millenium by indiscriminate promotion of international trade regardless of consequences.

Arnold P. Yerkes of International Harvester Co. made a good point concerning this in a speech recently before a chemurgic group in Texas. Said Mr. Yerkes:

> "It was only a short time after World War I that this country was importing far greater quantities of agricultural products than it was exporting. It has been said, with a great deal of truth, that we did not produce our surplus of farm crops which caused low prices — we imported it.
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> We not only imported coffee, bananas, pineapples, coconuts, and other products which we cannot grow in this country, but billions of dollars worth of starch and oil crops which could easily have been grown on American farms, or at least very satisfactory equivalents could have been produced here.
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> Dr. John Lee Coulter, well-known agricultural economist, recently stated that the people from whom we bought much of our imported starch and vegetable oil were actually going hungry themselves.
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> For us to buy and ship half-way round the world the crops other people produced and needed for their own welfare, and at the same time pay our farmers to destroy their crops, or to grow less, when what we need is more employment, does not seem very logical."

Probably a more logical approach will be to help the natives to process their own oil crops, the products to be consumed at home, at least in large part.

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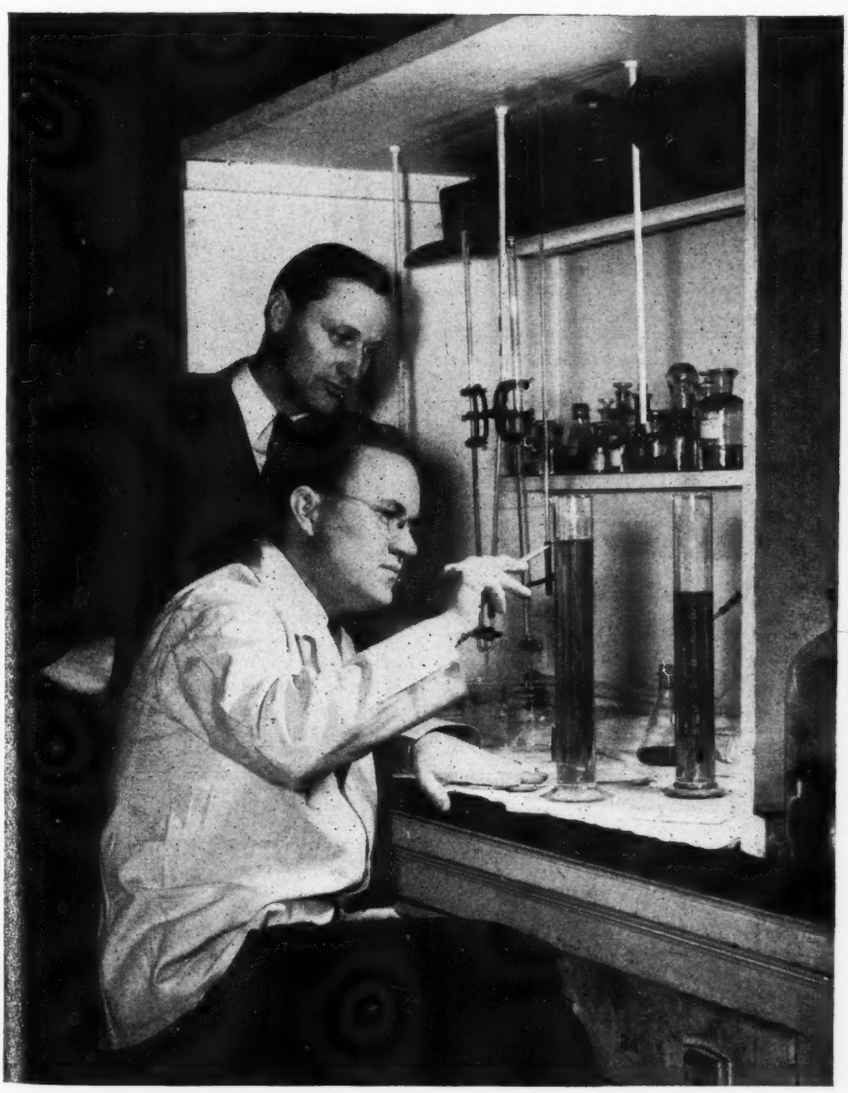
Soybeans in 1945

By J. W. CALLAND

• The author, who is director of agronomic research for Central Soya Co., Inc., takes a careful look at the crop in its relationship to other crops and to the soil. From an address before the American Society of Farm Managers and Rural Appraisers.

Lincolns Are High in Oil

One of the advantages of the new Lincoln soybean over the older varieties is a higher yield of oil. Dr. D. F. Beard, extension agronomist of Ohio State University, left, and Dr. J. Boyd Page of the University, compare the oil obtained from Lincoln and a standard variety. That in the tube at left is Lincoln. Dr. Beard says an acre of Lincolns produced 376 pounds of oil as compared to 302 by a standard variety.



LAST year the United States harvested a 200 million bushel crop of soybeans. What happens to a crop of 200 million bushels after we grow it? Of the total of 15 million acres planted to soybeans in 1943, two-thirds, or 11 million acres, were harvested as beans. Again two-thirds of these beans were processed—about 132 million bushels, the balance going for seed, carry-over and feed on the farms where they were grown.

Here are the products obtained from this 132 million bushels processed: 600,000 tons of soybean oil; three million tons of oil meal; and 300,000 tons of soy flour, grits, and flakes.

Here is how — in war time — these products were used: 90 percent of the meal was used for livestock and poultry feeds; the balance going into flour, flakes and grits for human consumption. A little meal found its way into glue for P. T. boats and into plastics for pistol-grips and helmets.

Ninety-five percent of the oil went to products for human consumption, largely shortening, margarine, and salad oils for the use of our civilians, armed forces and lend-lease. The balance of the oil went for industrial uses having priorities such as soap, protective coverings, textile and leather processing, glycerine, medicines, and printers ink.

Well, here we are with this new crop — soybeans. It is second to corn in acreage. It has largely happened in the last 10 years.

To the farm manager it brings a lot of production problems. You are now face to face with these problems. How many answers have you?

I have discussed these problems with the agronomists of the experiment stations, the universities and extension departments of Iowa, Illinois, Indiana, and Ohio, and they tell me many of these problems are as yet unanswered—there is much work to be done before we know even most of the answers about soybeans.

With their help I prepared what I shall call a discussion sheet, and took it into 40 counties in northeastern Indiana and northwestern Ohio, discussing it with the county agents, A.A.A. committeemen, farm managers, and prominent soybean growers.

After talking over the various factors connected with the production of soybeans with close to 100 such men in these counties, I was more than ever convinced that many of these problems were very much "up in the air" in the minds of the growers who are producing the crop.

Now, I understand that I am to say something about soybeans in 1945 and possibly on into the postwar period. I do believe, however, that before I try to "predict," it might be well to consider briefly some factors which I think have definite bearing on the future of soybeans. There are: 1. cash returns; 2. soil productivity; 3. erosion; 4. new varieties.

CASH RETURNS

Soybeans have become one of the most profitable field crops grown in the Cornbelt. The yield per acre has been increasing while the cost of producing the crop has been decreasing. This yield increase, coupled with current prices for grains, places soybeans next to corn in profit per

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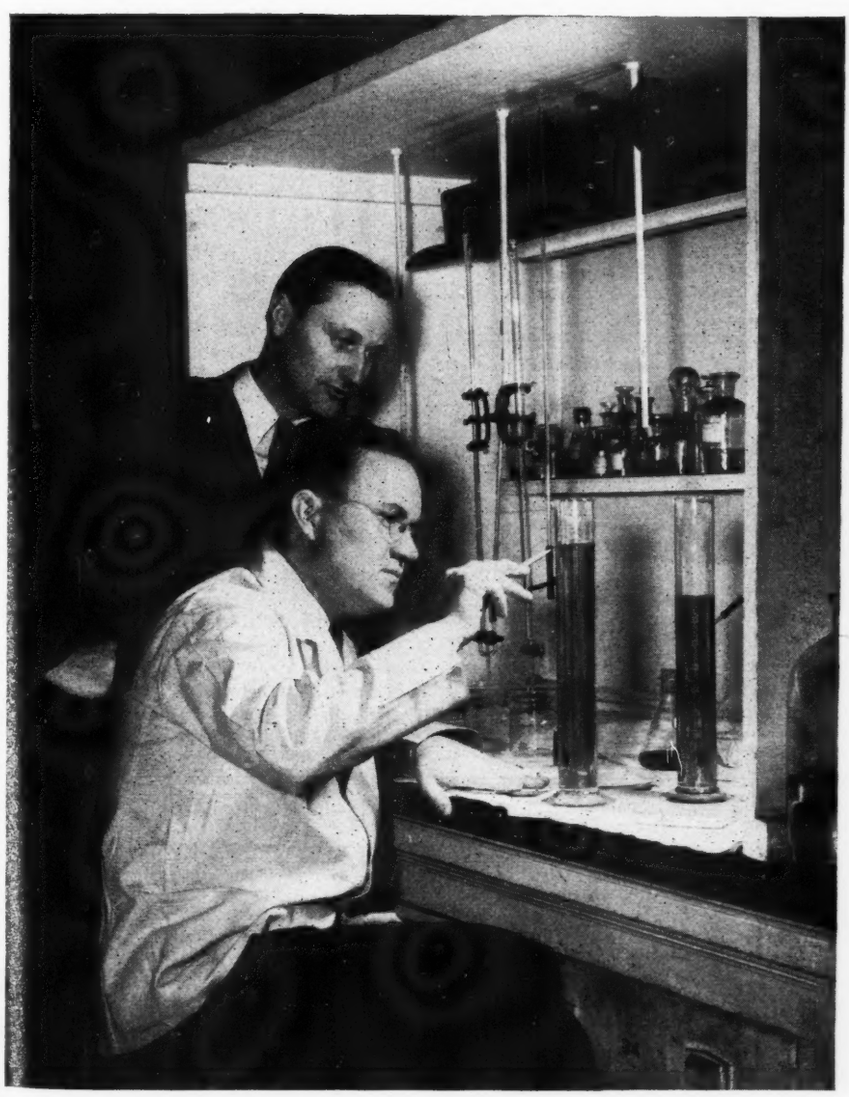

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acre after all production costs have been met.

Data prepared by Illinois University compares a net cost of 90 cents a bushel for producing soybeans in the period of 1930-32, with a net cost of 68 cents 10 years later for the period of 1940-42.

The 1943 yield of corn in this area was four bushels above the average of the preceding five years, whereas the soybean yield was two bushels below the five year average. If the five year yields had been obtained in 1943 the price of soybeans would have had to be 2.3 times the price of corn to have made an acre of beans as profitable as one of corn.

It is quite evident from this table that soybeans are a profitable crop. Not so profitable as corn, but definitely more profitable than wheat or oats. The oat crop has shown a loss in six of the last 10 years.

While soybeans remain in their present relative price position with corn, wheat, and oats, it is not likely they will take any more acres from the corn crop. But economical production and maintenance of soil fertility both require that a diversity of crops be produced on the farm. It is not profitable therefore to put all of the tillable land into one crop, although that crop may show the highest profit, when grown in a good rotation with other crops.

PLANS FOR 1945 CROPS

I wonder if the average Cornbelt farmer will not plan his crops in 1945 without any particular thought about the competition of corn and soybeans for his tillable acres. He is more likely to consider first how many acres of corn he can reasonably produce. Then next he will figure on what other crops he needs to balance out his farming operations, considering his livestock and feeding requirements.

After planning for the small grain crops he wants for his clover seedings and possibly some oats for feed, he will then pick soybeans as the best cash crop for the balance of his tilled acres. He will give some thought, of course, to the importance of rotating the crops on his various fields and in a general way consider maintenance of soil fertility.

But, however he plans it, he has been for the past three years arriving at about one acre of soybeans to five of corn in Iowa, one to three in Ohio, and one to two and a half in Indiana and Illinois.

SOIL PRODUCTIVITY

Since the introduction of the soybean crop into the Cornbelt, it has been rated by enthusiasts as a wonderful soil improvement crop and by critics as one of the worst soil depleting crops.

I have tried by consulting the various experiment stations and agriculture colleges to determine the place of soybeans in relation to soil productivity. It stacks up about as follows:

All crops harvested and removed from the land deplete the supply of nutrient elements. These elements must be replenished by intelligent soil management practices.

Most legumes, including soybeans, are heavy potash and phosphate feeders; but, if well nodulated, they are able to supply a large part of the nitrogen necessary for maximum growth by fixing atmospheric nitrogen.

Whereas a 50 bushel corn crop removes 50 pounds of nitrogen an acre, a 20 bushel soybean crop with the straw returned adds some nitrogen or at least breaks even. Moreover, a 20 bushel bean crop sold as seed and the straw returned to the soil removes slightly less phosphorus than a 50 bushel corn crop where the grain is sold and the stalks returned to the soil. However, the beans remove two and one half times as much potassium and more calcium than corn.

Alfalfa, also, draws heavily on minerals, one and one half as much phosphorus and almost 10 times as much potassium as a 50 bushel crop of corn. So, compared with corn, soybeans appear to draw heavily on the mineral elements, potassium and calcium, but when compared with alfalfa the demands of soybeans are quite modest.

By means of a system of soil productivity balances, Ohio agronomists calculate the percentage change occurring annually in the productivity capacity of farm soil under a specific cropping and management system. They use a plus or minus figure for the "soil productivity factor," or index for the collective influence of a crop on soil organic matter, tilth, nitrogen, and mineral nutrients.

Using this system, they rate soybeans as mildly soil depleting — giving it a numerical value of —0.5 in a scale where corn ranks —2.0, wheat —1.0, oats —1.0, and common clover +2.0.

Table 1—Showing Soil Productivity Factors of Various Crops 3/

Row and Drill Crops Harvested	Soil Productivity Factor
Corn	— 2.0
Wheat	— 1.0
Oats	— 1.0
Soybeans harvested for seed	
(Straw removed)	— 0.5
(Straw left on field)	— 0.25
HAY CROPS	
Clover, seeded 1 year before	+2.0
Alfalfa, seeded 1 year before	+2.5
Alfalfa, seeded 2 years before	+0.5
Alfalfa, seeded 3 years before	0.0

Norum, of Iowa station, reports the beneficial effect of soybeans on the yield of the corn crop following, to average about 9.5 bushels per acre on Iowa's Webster and Clarion soils. 4/ In a 25 year rotation at the Purdue Soils and Crops Farm, soybeans in the rotation increased the yield of corn and wheat by six to eight bushels. Drake and Scarseth, of the Indiana station 5/, state that these increased wheat and corn yields when soybeans were added to the rotation must be due to the additional nitrogen supplied by the soybean crop, since this soil was well supplied with available phosphate and potash. They also point out that even while soybeans were increasing the yields of other crops, they were at the same time depleting the supply of phosphate, potash and calcium in the soil. Illinois reports that soybeans improve the tilth of the soil, increase the biological activity and the amount of nitrate nitrogen in the soil. 2/

Agronomists all agree that the soybean is not a soil building legume, except when used as a green manure crop. However, there is quite a bit of evidence of its beneficial effects on the other crops in the

—Case Eag

Through dealer displays and by representatives on farm programs the J. I. Case Co. is doing some important work with soil conservation. Here two fathers and two sons study a display in the Weiss Hardware Co. store at Allentown, Wis. From left to right Dad Jos. Bingen and son Edgar; Son Alois Doll and Dad Arthur.

Table 2—The Principal Varieties of Soybeans Grown in 1944 in Each of the States of Ohio, Indiana, Illinois and Iowa. The percent of the Total Acres Planted in the State Is Given for each Variety.*

	Richland	Dunfield	Illini	Manchu	Mukden	Mandell	Gibson & Pctoka			Others
Ohio	26	11	2	31	0	8	0	Mingo	5	17
Indiana	20	20	5	24	0.5	15	10			5.5
Illinois	11	9	48	0.5	2	4	0.5	(Chief	15	
								(Macoupin	2	7
								(Mt. Carmel	2	
Iowa	43	2	12	16	19	0	0			8

* Data from various sources

Table 4—Story of Lincoln Increase—Data from Various Sources

State	1942 Producers	1942 Acres	1943 Producers	1943 Acres	1944 Producers	1944 Acres	Est. Bu. To Plant 1945
Iowa	1	3.0	5	250	110	1,600	36,000
Illinois	3	9.3	21	268	382	8,223	220,000
Indiana	1	1.1	5	101	300	5,333	115,000
Ohio	1	3.5	10	113	160	3,290	72,000
Missouri	—	—	—	—	3	65	1,600
Nebraska	—	—	—	—	1	50	1,200
TOTAL	6	16.9	41	732	956	18,561	445,800

rotation. And, it may be that these beneficial effects are most noticeable when the first limiting factor is nitrogen.

Soybeans have a marked effect upon soil tilth. The land is left loose and works easily. Because the soil is loose it will erode readily. Agronomists at Purdue 6/ state that the problem of erosion with soybeans is much the same as with corn; that on rolling lands soybeans should be planted on the contour, preferably drilled solid and should be followed by a winter grain or cover crop.

Missouri tests show soil losses with soybeans following clover to be but one-third as great as when soybeans follow corn. Also, that beans planted up and down the slope in 42 inch rows lost more than twice as much soil as where the beans were drilled solid. Iowa tests show an increase of 3.2 bushels per acre from contour planting of soybeans on rolling land, with gains of five bushels on some fields.

If soybeans preceded corn in the rotation instead of following one or more crops of corn, I suspect the erosion hazard of growing corn on rolling land would be more fully realized and less blame attached to soybeans.

It is certainly true, however, that to arrive at almost 15 million acres of soybeans we are now planting, much sloping land has been planted and that serious erosion has followed. While planting beans on this type of land may well be justified as a war effort, it should not be continued except where adequate conservation measures and practices can be used to control excessive soil and water losses.

HARVEST TIME

Father and son harvest soybeans near Mt. Vernon, Iowa. On the tractor is Luther Plattenberger, on the combine is son, Robert. The two own and farm two farms totaling 320 acres.

—Case Eagle

NEW VARIETIES

The principal varieties of soybeans grown in Ohio, Indiana, Illinois, and Iowa in 1944 are given in Table 2. In addition to these varieties, there were probably 50 minor varieties grown in these four states.

Agronomists and plant breeders now working with soybeans are all in agreement that our first production problem of the present time is one of getting the growers of soybeans to use the best adapted varieties. They say many of the problems connected with shattering, lodging, late harvesting, high moisture, poor quality, and low oil content can very largely be eliminated by growing the right varieties.

Outstanding among new varieties is the Lincoln soybean. It has been tested over the Cornbelt for the past six years in 95 cooperative tests conducted by the U. S. Regional Soybean Laboratory in cooperation with the various states. It has outyielded by four to six bushels all of the various midseason varieties now being grown in Ohio, Indiana, Illinois, and Iowa.

Besides outyielding by 20 percent the present standard varieties, it also has good standing ability, relatively free from shattering, and produces high quality seed with higher oil content. It should now replace all such varieties as Dunfield, Illini, Mandell, Manchu, Mukden, Chief, Mingo, and Scioto.

Table 3—Summary of Yield and Oil Content data for Lincoln, Illini & Dunfield in 95 Tests in 9 Soybean States including Ohio, Indiana, Illinois and Iowa—For the 6 Year Period from 1938 to 1943.*

Variety	Average Yield	Oil Content
Lincoln	32.9 bu.	21.3%
Illini	28.0 bu.	20.2%
Dunfield	27.4 bu.	21.0%
Average Superiority of Lincoln	5.2 bu.	0.7%

* Purdue University Experiment Station, Mimeo No. 42—"Lincoln Soybeans."

In 31 regional tests over a period of three years Lincoln has outyielded Mandell by 5.9 bushels and has contained 2.3 percent more oil. At Urbana, Ill., it has exceeded the average yield of Chief, Illini, and Dunfield by 6.4 bushels. In central Indiana it has outyielded Mandell, Dunfield, and Illini by 7.3 bushels.

Its range will probably be all of Ohio, all of Indiana, and Illinois except the most southern parts, and all of Iowa, with the probable exception of the two northern tiers of counties. Growers in northern Ohio, Indiana, and Illinois should remember that it is a midseason variety subject to frost.

The new early variety, Earlyana, released by Indiana last year will take a place of importance across the northern part of Iowa, Illinois, Indiana, and Ohio. It is almost a week earlier than the stiff-stemmed Richland, grows taller and does not set beans so close to the ground. It will be popular with growers wanting to put wheat after soybeans and should replace most all of the early varieties now grown in this area.

The job done by the U. S. Regional Soybean Laboratory and the cooperating states in testing the Lincoln variety and in increasing the seed to almost one-half million bushels before releasing it to the soybean growers last fall has been one of the outstanding accomplishments in pure seed development in this country. Table 4 shows how this seed was increased over a period of three years.

PLANT HALF OF CORNBELT

If the 10 million bushels of Lincoln beans to be produced in 1945 are used for seed in 1946, they will plant more than half the acres in the Cornbelt. If only one-half the acres in Ohio, Indiana, Illinois, and Iowa, are planted to Lincoln it will increase production in these states by 20 million bushels and the growers' income by $40,000,000 without planting an extra acre of beans.

Thus, we see the effect of better varieties on the future of the soybean crop. Still more improved varieties are in the making — some already bidding to excel Lincoln.

FUTURE OUTLOOK

Now when we try to look into the future as it will affect soybean production we must face a large array of unknowns. There are many things that both soybean processors and farm managers would like to know for their postwar planning. Will tariffs be lowered or abolished? If so, will any surplus of soybeans or soybean products find a place among our exports?

We do know that vast quantities of low production-cost oils such as coconut and palm oils are waiting the return of normal transportation to come into this country in competition with our domestic fats and oils. How seriously will these depress the price of soy oil? Likewise, how much will the competition of other proteins along with reduced numbers of livestock and poultry depress the price of soybean oil meal?

What new uses of soy products and what new products may be counted on to take a portion of our production? Will price floors and ceiling for farm crops

(Continued on page 21)

3/ Ohio State University, Extension Bulletin 207 —"Farming with Soybeans."

4/ Iowa State College of Agriculture F.S. 63 —"Do Beans Hurt the Soil?"

5/ Better Crops, Reprint BB-11-41. "Why Soybeans Should be Fertilized."

2/ University of Illinois—Bulletin 456

6/ Purdue University—Mimeo 48. "Are Soybeans a Menace to Soil Improvement?"

—USDA photo by Purdy.

Dr. Morse opens a box of black miso.

SOYS IN THE ORIENT

By W. J. MORSE

c/o American Consulate
Dairen, Manchuria
July 20, 1930

Dr. W. L. Burlison, President
American Soybean Growers Association
University of Illinois
Urbana, Ill.

Dear Soybean Friends:

When the writer addressed a letter to your 1929 annual meeting, the soybean experience of the U. S. Department of Agriculture Oriental Agricultural Expedition was just beginning and there was little of interest to write on this most important crop of Asiatic countries. It is quite different now, however, for explorations have been made in Hokkaido Island, Hondo (the main island of Japan), Korea and to some extent in Manchuria. If an attempt were made to write at all fully on the different phases of the soybean industry we have observed in these countries during the past year or more, a volume or perhaps several, would have to be written instead of a mere letter.

It is recalled that last season the use of the soybean as a green vegetable was described. Throughout the season, it was found that the green vegetable soybean was a very popular food with the Japanese from one end of the Japanese Empire to the other. The vegetable soybean is classed as a garden bean and as such is extensively grown by the Japanese truck farmers.

About the middle of August, we went to the Island of Hokkaido, north of the main island of Japan, and established headquarters at Sapporo. Hokkaido has the largest acreage and production of soybeans of any of the prefectures in the Japanese empire. We remained on this island until early October and visited all of the principal soybean sections. Several excellent experiment stations are scattered about the island and the most important of these were visited, especially those conducting soybean work. The Obihiro Station in the eastern part of the island is conducting the most extensive work in breeding and variety testing. We succeeded in collecting a very large number of varieties and selections of this northern region as well as information on culture, harvesting, threshing, insect pests, and diseases. To supplement this material, we obtained a large number of still and motion pictures of very interesting scenes of the Hokkaido soybean industry.

Leaving Hokkaido the first week in October for Tokyo we visited on our way the principal soybean sections of northwestern Japan. The soybeans were just beginning to mature, so we had an opportunity of seeing the varieties most generally grown in northern Japan and of studying the methods of culture and harvesting. The experiment station at Akita is doing extensive work in breeding and testing varieties for northern conditions, and they gave us samples of seed of their best varieties and selections.

KOREA VISIT

Our time in Tokyo was short for within a few days after our arrival we left for Korea and about the 20th of October established headquarters at Keijo (Seoul). Unfortunately, we could not be in two or more places at the same time for while we were studying the soybean and other crops in Hokkaido and northern Japan, the beans were being harvested in Korea. Therefore, when we finally reached Korea, the soybeans had all been harvested, but quite fortunately, we found ourselves in the midst of the threshing and shipping season. In our travels about the most important soybean sections we found the methods of threshing and cleaning very interesting and decidedly primitive. The methods of grading, cleaning, transporting, and utilizing were also studied and in addition to securing valuable data, we obtained many excellent still and motion pictures of various soybean scenes.

We found Korea to be a most interesting country and different from anything we had seen in Japan. One of the most amazing things was the extent to which soybeans are grown. Almost equally amazing was the large number of native Korean soybean varieties we found in the various sections and at the experiment stations. At the Suigen Experiment Station, they have more than 1,000 native Korean varieties and selections under test. The authorities were very generous and gave us samples of each. In addition to this collection, we obtained a few hundred samples from Korean farmers, grain merchants on village market days and from village and city grain dealers. The Korean Department of Agriculture added about 300 samples to our collection by obtaining seed

of the principal varieties from the village agricultural societies in each of the prefectures of Korea.

Although the Koreans do not use the soybean as extensively for food as do the Japanese, considerable quantities are used and in quite different ways. The beans are used principally boiled with other grains such as millet or kaoliang. They are also used in making miso and soy sauce, but these products are made quite differently from those of Japan and China. Soybean sprouts were found very abundantly in all of the markets and at all of the small food stores. The beans produced in Korea are for the most part of excellent quality and are largely shipped to Japan for the manufacture of miso, soy sauce, bean curd, and natto. Soybeans when soaked with chopped millet or kaoliang straw are used universally for feeding oxen and cows, the common work animals of Korea.

CANDIES, CONFECTIONS

We left Korea about the first week of December for our Tokyo headquarters and collected seed samples and products as we went along. From the latter part of December until the latter part of March, we put in full time collecting soybean products and learning of their use and manufacture. We succeeded in collecting a large number of interesting products, as the Japanese use the soybean very extensively in their daily diet. In the making of cakes, candies, and numerous other confections, the roasted soybean is used in a similar manner to the peanut in America. Of course, soy sauce, miso, bean curd, and natto are the principal soybean products and the ones most extensively used. As an example of the large use of miso, which is used as a breakfast soup with vegetables and also in preserving fish, vegetables and meat, we visited three large miso factories in the Tokyo district and found that each produced about 1 million pounds of miso yearly. In addition to these three large factories, there were numerous small factories scattered throughout the same district.

As the planting time was approaching in Manchuria, we left Tokyo the latter part of March and arrived in Dairen, Manchuria, the first of April. We expect to have headquarters at Dairen until late fall or early winter, working out in the various soybean sections of north and south Manchuria. This country is the real land of the soybean and Dairen, the real city of the soybean. In 1929, 29.2 percent of the total cultivated area of Manchuria was devoted to the growing of soybeans, producing more than 178 million bushels of seed, thus leading all other crops in acreage and production. The Port of Dairen handles about 80 percent of the exports of beans, bean cake, and bean oil.

The planting season for soybeans in Manchuria begins about the first of May and extends to about the 25th of May in some of the northern sections. We, therefore, had an opportunity before the planting season began, to study the oil mills and the methods of grading, storage, and transporting of beans, bean cake, and bean oil. The storage and warehouse yards of the South Manchurian Railway cover several hundred acres and the immense quantities of bags of beans and bean cakes in the open storage yards and in the warehouses are well worth seeing. In connection with the storage yards are the Dairen wharves where one may see daily the loading of freighters from European countries, America, Japan, and China with beans, bean cakes, and bean oil.

We had rather expected to find a large number of products made from beans, bean cake, and bean oil but our findings thus far have been very meager. The oil is used in the manufacture of soaps, paints, lard substitutes, and salad oils, but only a very few factories are engaged in producing these products. The beans

At top, fried soybean curd. At bottom tofu residue, widely used with fresh vegetables and cooked in soy sauce.

• *Timely information about the soybean in the life of the Asiatics — written in 1930! Places mentioned have since come alive for Americans. When this letter was addressed to the 1930 meeting of the American Soybean Association, Dr. W. J. Morse and P. H. Dorsett were explorers for the U. S. D. A. Bureau of Plant Industry. Varieties they collected have since largely formed the basis for the U. S. soybean industry. A letter written from Tokyo by Morse in 1929 was published in the January* DIGEST.

are used chiefly for oil and oil cake, but during the last three or four years, the demand of European oil mills for beans has had a serious effect, not only on the Dairen soybean oil mills, but also on the oil mills throughout north and south Manchuria. In Dairen at the present time, only about 45 soybean oil mills are active during the crushing season, whereas four years ago there were about 90. The oil cakes are for the most part shipped to the Japanese Islands for feed and fertilizer (chiefly fertilizer), to China and the East Indies for fertilizer, and to America and Europe for cattle and poultry feed.

Our experience in the field up to the present time, has been the study of methods of planting and cultivating practiced in different sections of north and south Manchuria. South and east of Mukden, soybeans are planted with other crops, generally corn. North of Mukden, the beans are planted alone. All mixed and single plantings are made in 21-inch rows. In the mixed plantings of corn and soybeans, the corn is planted about May 1 in hills about 42 inches apart. When the corn is about 6 inches high, beans are planted midway the hills of corn with six to 10 beans per hill. About bean-planting time, the corn plants are thinned to one plant per hill, but the beans are never thinned.

SOURCE OF VIRGINIA

We have collected quite a number of seed samples during our travels thus far in Manchuria and have obtained some very interesting types. It may interest the members to learn that we have visited Yingkou (Newchwang), the source of the Virginia and Wilson varieties. We obtained several other black and brown-seeded samples similar to the Virginia and Wilson, and are hoping that some of them may prove equally valuable. It was learned that the black and brown-seeded sorts are grown in some northern sections along the Liao River. In the study of varieties in different sections of North and South Manchuria, it has been very interesting to note the number of varieties, their utilization and adaptability to various soil and climatic conditions. At the Kungchuling Experiment Station, more than 1,000 varieties and selections have been tested but at the present time only 500 are under test. The Manchurian varieties do not succeed in the Japanese Islands and neither do the Japanese varieties succeed in Manchuria or Korea. The Korean varieties also give rather poor results in most of Manchuria.

We hope to be with you at your next annual meeting, that we may try to catch up with the rapid progress the soybean has made in the United States during the past two years.

With best wishes for a most interesting and successful 1930 meeting, we remain

Very truly yours,

Dorsett & Morse,
Agricultural Explorers.

per WJM

The soybean as a cultivated crop lends itself to contour farming. On rolling land the topsoil may be saved and enriched through proper handling and fertilization of the soybean crop.

Rock Phosphate
As a Fertilizer for Soybeans

By H. J. SNIDER

Assistant Chief Soil Experiment Fields, University of Illinois College of Agriculture, Urbana, Ill.

Rock phosphate when used on the soybean crop has been found to give some increase in acre yield of both hay and beans, and in addition has added considerable quality to the crop. These results were obtained by the Illinois Experiment Station mainly on Cornbelt soils which were deficient in available phosphorus. Soybeans like most other crops have certain peculiarities which cause them to respond differently than other crops to various form of fertilizers. On the other hand, rock phosphate has certain characteristics which must be recognized when it is applied to soils.

Questions regarding the use of various fertilizers on soybeans have come into prominence because the soybean crop has more recently come into rather general production throughout the Cornbelt. In 1944, there were nearly 11 million acres planted to soybeans in the 11 Cornbelt states. This was over 80 percent of the total acres planted in the entire United States. With this enormous acreage in this relatively small Cornbelt area there is likely to be great interest and much effort directed toward increasing acre yields by means of various soil treatment practices.

The large amount of fertility elements removed in soybeans is another important reason for the considerable interest in the use of fertilizers on the soybean crop. At maturity of the crop, the beans were found to make up approximately 30% of the entire growth including roots and tops. This 30% of beans contained approximately 70% of the nitrogen, 75% of the phosphorus and 60% of the potassium in the entire crop. It was found also that a 25 bushel an acre yield of soybeans of the Illini variety contained in the growth above ground, 135 pounds of nitrogen, 8.9 pounds of phosphorus and 39 pounds of potassium. If the amounts of these three elements were replaced in the soil by soluble fertilizers at present prices this would involve a cost of $17.25 an acre. Fortunately, this entire amount may not be removed from the soil by a single soybean crop. When beans are harvested with a combine the leaves, stems, and hulls are left on the land. We are reasonably safe in assuming that about two-thirds of the nitrogen in the crop is obtained from the air by legume organisms. This means that only about one-third of the nitrogen in the crop is taken directly from the soil. On this basis, 25 bushels of beans remove from the soil approximately 33 pounds of nitrogen, 6.8 pounds of phosphorus, and 28 pounds of potassium. At fertilizer prices, these three elements would have a value of slightly over $6.00 which is still a sizeable amount.

Rock phosphate used on soybeans over a period of years has been found to increase the bean yield by two bushels an acre and also increase the quality of the beans. Beans from phosphated land contained slightly more protein and considerably more mineral phosphorus. These are important constituents and would have considerable value in soybean meal used for feed. These results were obtained on soils

which were deficient in available phosphorus.

Soybean hay had an increase of 500 pounds an acre on land where rock phosphate was used. Soybeans were cut for hay when the pods were well formed and with all leaves still on the plant. The hay from the phosphated land contained slightly more protein and had a higher total mineral content than hay from unphosphated soil. Hay from the phosphated land contained three pounds phosphorus per ton and was considered to be of good feeding quality because the phosphorus content was up to three pounds a ton of dry hay. On unphosphated land, the hay contained from 2.2 pounds to 2.4 pounds of phosphorus per ton and was considered inferior in feeding quality because the phosphorus content was considerably below three pounds a ton of dry hay.

Rock phosphate for best results may be applied at rates which vary around 1000 pounds an acre. The phosphorus removed by crops from rock phosphate in the soil has been found to vary from 2 to 3% up to as high as 10% removed each year. The amount of phosphorus removed depends on the crop and somewhat on the soil and season. It seems safe to assume from these figures that 1000 pounds an acre of rock phosphate will give maximum results for about 10 years before the amount in the soil should be replenished.

Soybeans have been found to be very sensitive to potassium deficiency in soils. Over an average of five years potassium treatment increased the soybean hay yield by 1600 pounds dry hay an acre. The bean yield was increased by approximately 10 bushels an acre by the potassium treatment. There was no evidence that this treatment appreciably affected the quality of the hay or beans. These tests were made on land which was very deficient in available potassium. The soybeans were grown in a rotation of corn, soybeans, wheat, clover, and the potassium treatment was in the form of muriate of potash put on at the rate of 100 pounds an acre each year in addition to limestone and rock phosphate.

Soy Moves to Ports by Rail

Approximately 10,900,000 tons of foodstuffs were hauled last year by the American railroads for the army and navy, the Association of American Railroads reports. If the cars required to handle this load were placed end to end, they would make a train reaching from coast to coast.

According to army estimates, the railroads transported about 244,000 carloads of foodstuffs in 1944 for that branch of the service alone. This included 41,240 carloads of meats, 5,225 carloads of poultry, 3,900 carloads of butter, 4,280 carloads of fresh eggs, 12,440 carloads of sugar, and 2,800 carloads of dried beans and peas.

The navy estimates that approximately 120,000 carloads of food were shipped by rail in this country to naval activities last year, either from producers or from supply depots to the smaller activities. This rail movement of navy foods consisted of about 54,000 carloads of dry provisions and 66,000 carloads of fresh, chilled or frozen foods.

Besides the huge quantities of food which the railroads hauled for the army and navy last year, they moved considerable food for our allies under the lend-lease program. In 1944, these rail shipments amounted to approximately 121,200 carloads. Some 37,800 cars contained meats and meat products; more than 22,850 carried dairy products, and about 22,000 moved grains and cereals.

Large quantities of soybeans and soybean products were exported from this country in 1944, and most of this traffic was moved to the ports by rail. The shipments listed by War Food Administration for lend-lease, the army and navy and various relief agencies are as follows:

Soy flour and grits	82,539,100 lbs.
Soybeans	10,189,630 lbs.
Soybean oil meal	16,194,700 lbs.
Soybean seed	18,000 lbs.
Soy oil	1,239,000 lbs.

All fresh foods, such as fruits, vegetables and meats, were shipped in refrigerator cars. Freight that did not require refrigeration or ventilation, such as grain, grain products and dry foodstuffs, was hauled in box cars. Highly perishable foods, such as seafoods, strawberries and other fresh fruits and vegetables, were carried by express.

"DRISOY" IS NEW KELLOGG PRODUCT

An announcement from the research laboratories of Spencer Kellogg and Sons, Inc., describes the development of a new drying oil for the protective coatings industry, manufactured from soybean oil.

The new product, the result of long experimentation puts processed soybean oil finally and reliably into the drying oil class, generally equal in properties to linseed oil for paint, varnish and synthetic resin manufacturers. It is expected that the new oil, which has been given the brand name "Drisoy" will compete with linseed varnish oils both during the emergency and after free markets are restored following the war.

"Drisoy" is furnished by Spencer Kellogg and Sons, Inc., in two viscosity types: "Drisoy-A" of F-G viscosity and "Drisoy-B" of D-E viscosity. "Drisoy-A" is recommended generally for the same types of paints and varnishes in which linseed is used. "Drisoy-B," having lower viscosity, is particularly adapted to the making of alkyds.

The development of Drisoy has already reached the production stage and experimentation with standard varnish formulations has already been conducted. In "25 gallon" length varnishes, for example, comparable lots show practically equivalent setting time for Drisoy and linseed varnish films and for hard dry the time of the new oil is only slightly slower.

While wartime restrictions prohibit the use of soybean oil in paints and varnishes generally, permission has been received for the manufacturers of Drisoy to furnish test quantities to firms in the protective coating industries who desire to conduct their own experiments.

—s b d—

ONE MORE POD REPORT

The Soybean Digest,
Hudson, Iowa.

To the Editor:

I have been very much interested in your reports of pod number on soybean plants. In our breeding nursery this year we had one plant which produced 356 grams or a trifle over 12 oz. of seed. Since we did not count the pods, it has been necessary to calculate pod number. On the basis of seed size we have calculated 2225 seeds and with an average of 2.5 seed per pod would give approximately 890 pods.

While this calculated pod number is below that reported by Mr. Davis of Clayton, Ill., yet the seed weight slightly exceeds his. This was an F_1 plant grown in 42-inch rows with plants spaced 12 inches apart in the row.

Very truly yours,
E. E. Hartwig,
Assistant Agronomist,
North Carolina State College, Raleigh, N. C.

We are glad to get these reports. The plant mentioned reported by Russell S. Davis bore 1,043 pods, with 2,564 beans. See March DIGEST, *page 18.—Editor.*

1944 REPORT FROM MISSOURI

Soil Fertility and Soybean Production Program

• Missouri held a second very successful yield contest in 1944. As in 1943, it was sponsored jointly by the extension service and the Alton Railroad.

By ARNOLD W. KLEMME
Extension Associate Professor of Soils
University of Missouri

THE SOIL fertility and soybean production program which was started jointly in 1943 by the Missouri agricultural extension service and the Alton Railroad in seven counties adjacent to that railroad was continued in 1944.

There were 118 farmers from seven counties entered in this program with five acres or more of soybeans enrolled in two classes — A and B.

In Class A the entry in each county with five acres or more obtaining the highest percentage increase in yield of the treated area over the untreated was given a $25.00 war bond by the Alton Railroad. There were 27 entries in this class.

In Class B the county entry which obtained the highest yield per acre in five acres or more was given a $25.00 war bond by the Alton Railroad. There were 77 entries in this class.

The above awards were made at the annual county winter soils and crops meetings by A. F. Stephens, agricultural agent of the Alton Railroad.

Gilham Orear of Grand Pass was the Saline County winner enrolled in Class B. He obtained 39.9 bushels per acre which was the highest yield of the 118 entries. The seedbed was prepared for alfalfa on a limed 11-acre field to which 300 pounds of 20 percent superphosphate was applied. The alfalfa was killed by flood. A new seedbed was then prepared and the field planted to Chief soybeans in 40-inch rows.

County winner and second place in this class among all entries went to Ray Balomey of Frankford, Pike County, with 39.6 bushels. Mr. Balomey grew the Illini beans on land which had been in clover in 1942.

County winner and first place among all entries in Class A went to Albert Tyree of Higginsville, Lafayette County, who grew McCoupins. Mr. Tyree plowed under 150 pounds of 0-20-0 plus 3 tons of manure per acre. He obtained 27.5 bushels per acre on the treated part of his field as compared to 18 bushels on the untreated area. He obtained 9.5 bushels per acre for soil treatments.

Fertilizers give best results on soybeans when they are placed on plow furrow. There the moisture supply will be most constant so that it can more readily react with the soil and be in the zone of the plant roots when the plant is making the greatest demands on the soil for fertility.

Second place among all entries in Class A and county winner went to A. L. Dunwoody, Moberly, Randolph County. Mr. Dunwoody planted the Illini variety on a limed clover and lespedeza field upon which he plowed under 200 pounds of 4-12-4 per acre. On the fertilized-limed portion of the field he obtained 28.7 bushels per acre. On an untreated portion of the field he obtained only 19.3 bushels, or 8.4 more bushels per acre for soil treatments.

The winners in each county for each class, the soil treatment used, previous crop on the land, variety grown, and yield per acre are given on the following page.

While the average yield of soybeans in Missouri in 1944 was 17.5 bushels per acre, the five county winners in Class A who used fertilizer plowed down immediately ahead of planting the soybeans obtained 24.4 bushels per acre or an increase of 6 bushels per acre for the use of fertilizer. The average yield per acre on the untreated plots was 18.4 bushels per acre as compared to 24.4 bushels where the fertilizer was used.

The average yield of the seven county winners enrolled in Class B was 33.1 bushels per acre. These cooperators have been using soil treatments for a number of years or had soils high in fertility. The average yield per acre exceeds that of the group using untreated soils 14.7 bushels, and where treatments were used immediately ahead of planting 8.3 bushels. Their yield exceeded the average Missouri yield by 15.6 bushels per acre.

Where yield comparsions were made on similar soils well supplied with lime and deficient in lime, the limed soils produced five to seven bushels more soybeans per acre than unlimed soils.

Fields which had grown legumes such as sweet or red clover in the past year or two were well supplied with decaying organic matter, and produced the highest yields.

Where most of the weeds were killed by frequent cultivation ahead of planting aided in obtaining higher yields. When planted in rows higher yields were obtained by spacing rows as closely as possible, yet the use of regular cultivating equipment was permitted.

These results further substantiate the

fact that to obtain high acre yields of soybeans requires:

1. A natural fertile soil or one made fertile by soil treatments. Namely, one which is able to deliver ample soil fertility throughout the entire growing season.

2. Inoculation.

3. Adapted varieties.

4. Timely cultural practices to control weeds.

PROGRAM TO BE CONTINUED IN 1945

This soybean production program will be continued through 1945. All soybean growers in the counties adjacent the Alton Railroad, namely, Lafayette, Saline, Howard, Randolph, Boone, Audrain, Callaway, Pike, and Ralls counties are eligible to enter and compete for the following awards offered by the Alton Railroad in each county.

$25.00 war bond to the soybean grower who enters the program and obtains the highest yield per acre.

$10.00 in war stamps to the soybean grower who obtains the second highest yield per acre.

Gilham Orear of Grand Pass with Chiefs led the 118 entrants in yield per acre.

$5.00 in war stamps to the soybean grower who obtains the third highest yield per acre.

These awards will be based on No. 2 yellow beans on areas of 10 acres or more, and in counties with 20 or more entries per county.

Entries are to be made at county agents' offices before July 1.

SOYBEANS IN PASTURE TESTS

Three thousand to 4,000 pounds of dry grass per acre is a good yield for a bluegrass pasture, and yet in experiments recently conducted by the University of Illinois Agricultural Experiment Station over a six-year period it was found that other pasture crops, including soybean combinations, yielded from two to two and one-half times as much, reports W. B. Nevens, professor of dairy cattle feeding, University of Illinois College of Agriculture.

Bluegrass, rye, bromegrass, alfalfa and Sudan grass-soybean combinations were the crops studied. Bromegrass and alfalfa each produced more than 6,000 pounds of dried crop per acre. Winter rye produced nearly 3,300 pounds of dry matter annually, or practically as much as bluegrass. A Sudan-soybean mixture followed winter rye, yielding about as much as bromegrass or alfalfa. The rye-Sudan-soybean combination produced nearly 50 percent more than either alfalfa or bromegrass. On the other hand, bluegrass yielded only a little more than half as much as bromegrass or alfalfa.

Nevens reports that these pastures were grown on soils naturally high in productive capacity, but a still more important factor was the large amounts of barnyard manure which were applied annually.

Missouri 1944 Winners

CLASS A

Name & Address of Cooperator	County	Soil Type	Previous Crop on Land	Variety	Soil Treatment and Method of Application	Yield in Bushels Per Acre
Gilbert Fowler Vandalia, Mo.	Ralls	Putnam	Corn	McCoupin	150 lbs. 0-14-7 drilled & plowed under	22.6
					None	17.4
Tom Maxwell Mexico, Mo.	Audrain	Putnam	Sweet Clover	McCoupin	200 lbs. 4-12-4 drilled & plowed under	22.5
					None	18.3
A. L. Dunwoody Moberly, Mo.	Randolph	Putnam	Red Top Lesp.	Illini	200 lbs. 4-12-4 plus lime	28.7
					No Treatment	19.3
Milt Jackson Armstrong, Mo.	Howard	Grundy	Corn	Illini	0-20-0 broadcast on surface & plowed under	20.4
					None	19.3
Albert Tyree Higginsville, Mo.	Lafayette	Summit	Soybeans	McCoupin	150 lbs. 0-20-0 drilled & plowed under plus 3 tons manure	27.5
					None	18.0

CLASS B

Name & Address of Cooperator	County	Soil Type	Previous Crop on Land	Variety	Soil Treatment and Method of Application	Yield in Bushels Per Acre
George W. Winders Vandalia, Mo.	Ralls	Putnam Silt Loam	Corn	Illini	100 lbs. 45% phos. with wheat drill	23.5
Ray Balomey Frankford, Mo.	Pike	Bottom Land	Corn-clover under	Illini	None	39.6
Chas. Davenport Mexico, Mo.	Audrain	Putnam Silt Loam	Soybeans plus 0-14-7	Chief	Lime—3 tons	36.7
Raymond Roberts Cairo, Mo.	Randolph	Putnam Silt Loam	Corn 200 lb. 0-14-7 plus sweet clover, 1942	Illini	200 lbs. 0-14-7 1942-43-44	35.7
Labe Malone Armstrong, Mo.	Howard	Grundy Silt Loam		Illini	None	21.9
Gilham Orear Grand Pass, Mo.	Saline	Bremer Silt Loam	Seedbed prepared for alfalfa which was killed by flood	Chief	300 lbs. 0-20-0	39.9
John S. Stewart Higginsville, Mo.	Lafayette		Sweet Clover			34.0

SOYBEANS . . . and People

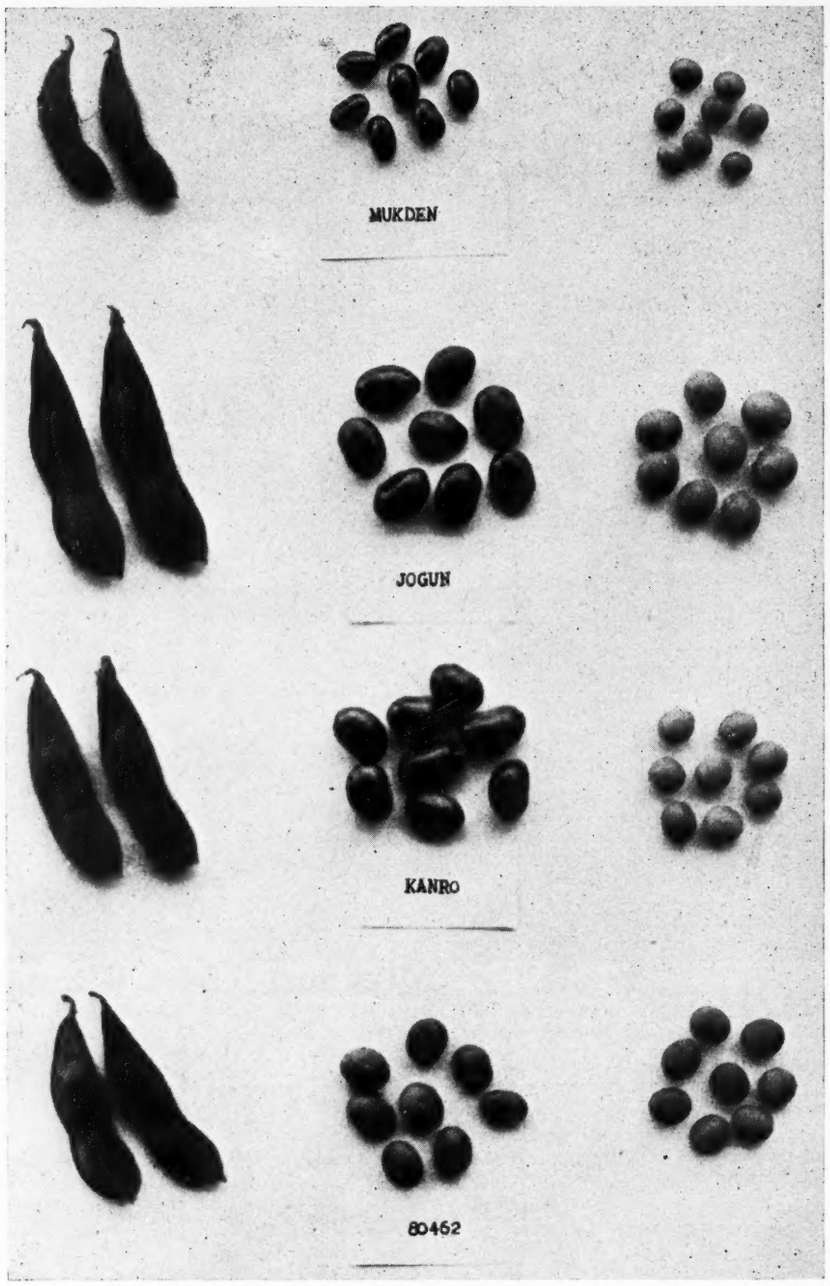
EDIBLE SOYBEANS

By E. P. WALLS
Canning Crop Technologist,
University of Maryland*

Since all soybeans are "edible," probably a better name for those types and varieties which have been developed for table use and for canning would be "vegetable type" soybeans, to distinguish them from the better known agronomical types used for hay crops and soil improvement purposes.

In 1907 Dr. C. R. Ball of the U. S. Department of Agriculture published descriptions of 23 varieties, which apparently were all that were then known in the United States. Records indicate that up to the present time something over 10,000 samples, representing some 2,000 distinct types, have been collected from various countries of the Orient. Maturity ranges from 70 days or less to over 200. This at once presented a huge problem of determining adaptations to soils and climatic differences in various parts of the United States. However, by the cooperation of the federal Department of Agriculture and the various state experiment stations, this has been accomplished and the most poorly suited varieties discarded, until now there are about 100 varieties that are being widely grown.

About 10 years ago attention was called to a special group of varieties which possessed particularly good flavor and palatability so far as human food is concerned. Mr. W. J. Morse, who spent two years in the Orient in the late twenties, brought back varieties of this type, which were planted at the Arlington Experiment Farms and later seed of these were distributed to the various states for trial. From this beginning a number of varieties have proven to give acceptable yields and to have acceptable quality as a table vegetable, used either fresh or canned.



Pods, green beans and mature beans of field variety and three vegetable varieties. Photos by Iowa Agricultural Experiment Station.

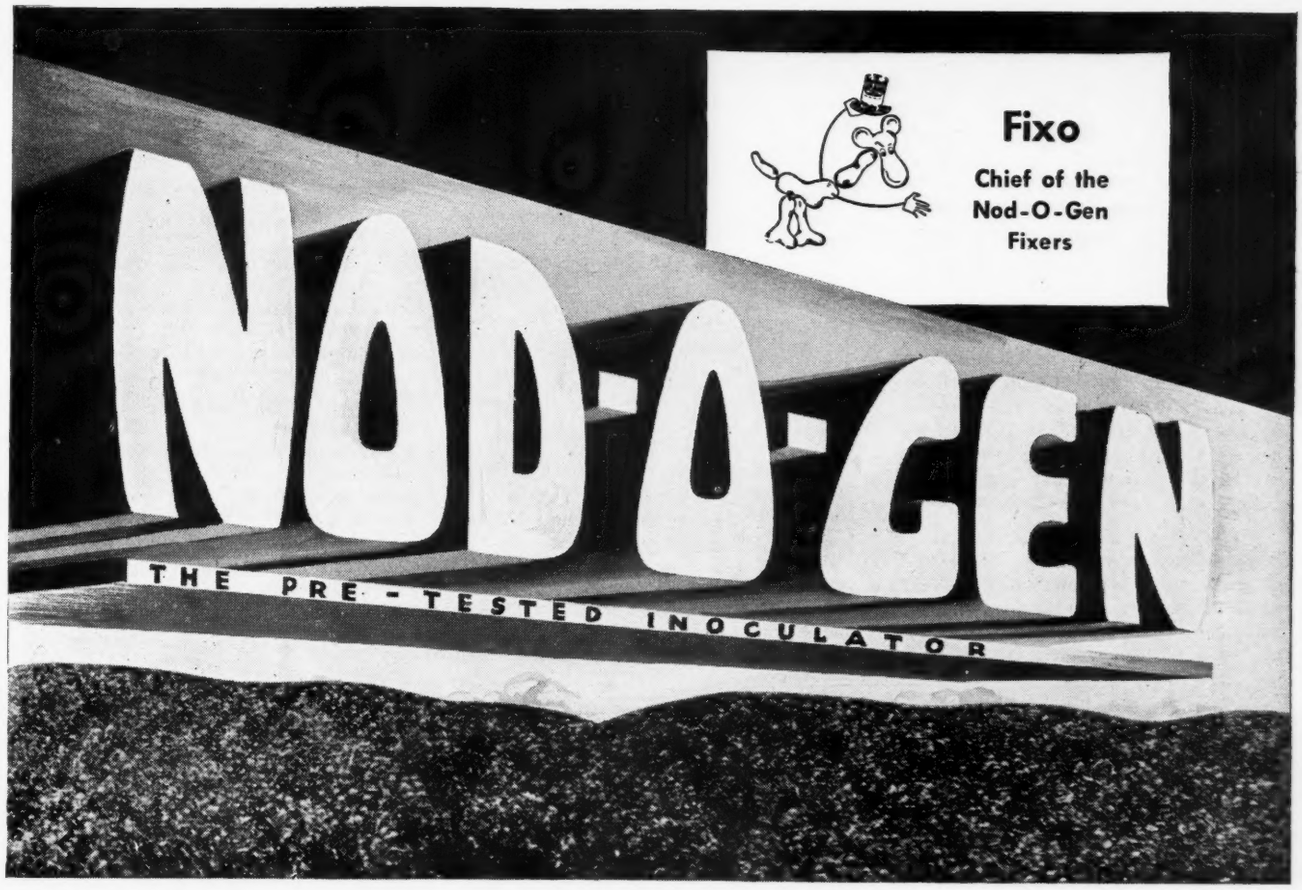
WORK AT MARYLAND

In 1939 canners and growers began making inquiries about the possibility of this legume as a canning crop. Growers wanted to know the method of culture and harvesting and how late they might be planted in order to make a crop. Canners were concerned about the best varieties for canning, how they should be handled after they were delivered to the factory, and the best method of cannery procedure, in order to produce an acceptable canned product. In order to answer these questions and others that might arise, field and canning trials with this crop were made a part of the canning crops program for 1940 and these investigations have continued since that time.

Since no well-recognized canning procedure had been established for this crop, all available information was secured and after certain modifications, the following procedure for canning was adopted and has been followed throughout the four years of work. The hulled beans are washed thoroughly with cold water, followed by a hot water wash at about 190° F; hand pick to remove any extraneous material and any broken or overmature beans; blanch for ten minutes in water at 190° F; on removal from blanch wash with luke-warm water (105° F) and fill into cans; add salt brine, 25 lbs. salt to 100 gals. water, at or near the boiling point and process 40 minutes at 240° F for No. 1 cans, and cool promptly.

Each year, after the beans had been canned a sufficient length of time to allow them to "set up" in the can, a group of judges including food technologists, licensed federal graders, canners and others working in the industry, met and critically examined and scored the samples for *color, character of liquor, flavor* and *maturity*. The average score for all judges for all items showed that Emperor was significantly higher in quality in 1940 than any other variety. In 1941 it again ranked highest in quality but was not sig-

*Miscellaneous Publication No. 28, Contribution No. 1934 of the Maryland Agricultural Experiment Station, (Department of Horticulture).



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nificantly better than Giant Green, Toku, Jogun, Higan, Hokkaido or Willomi.

While from the standpoint of canning quality alone, Emperor attained the highest rank for the two years, when considered from the standpoint of commercial production this quality score is so nearly approached by some of the other varieties, yield and quality taken together might make some of the other varieties more desirable.

The factor of *character of liquor* is a very important item in evaluating the quality of this product. There is a marked tendency for the liquor to "jell" after the cans have stood for a time. This makes a very unattractive product. In 1940 Bansei, Toku and Giant Green each received higher score for this item than did Emperor, but in 1941 samples Emperor exceeded all other varieties in this respect.

Observation has led to the belief that jelling is closely associated with maturity and this can be largely avoided by harvesting the beans at the stage just before any white or yellow beans have made their appearance.

The crops for these two years were grown on a sandy loam soil in rows three feet apart and four inches apart in the row. Planting dates were May 29 and May 26. A 5-10-5 fertilizer was applied in bands on each side of the row at the rate of 650 lbs. per acre. The stage of maturity at harvest time was as nearly the same as careful field inspection could make it.

In 1942 the field trials were expanded to include several different planting dates May 20, June 12 and July 1 and a comparison of row culture with that of drilling the beans with a grain drill. In 1943 the same type of experiments were continued but results were not very representative due to drought.

Varieties grown in the four years have included Sousei, Giant Green, Bansei, Toku, Jogun, Higan, Hokkaido, Emperor, Willomi, Imperial, Aoda, and Mendota, making twelve in all.

QUALITY RATING

Quality rating 1940=Emperor (1), Bansei (2), Higan (3), Giant Green (4), Toku (5), Hokkaido (6), Jogun (7), Imperial (8), Willomi (9).

Quality rating 1941=Emperor (1), Willomi (2), Jogun (3), Toku (4), Higan and Hokkaido (5), Giant Green (6), Imperial (7), Sousei (8), Bansei (9).

Aoda is a long maturing variety, about 130 days, Mendota 68 days.

It has been found that soybeans may be hulled satisfactorily with a pea viner by using pea screens. An experienced viner operator will soon be able to adjust the speed of the machine and the rate of feeding to accomplish satisfactory results. However, whenever possible, it is recommended that viners be used in tandem. It has also been found that satisfactory yields may be obtained with plantings made after early crops, such as peas, are harvested, although the most satisfactory planting dates for Maryland have been shown to be the latter half of May.

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Forecast Some Drop in Acreage

A slight decrease from last year is in prospect for the 1945 soybean acreage *planted alone for all purposes*, reports the U. S. Crop Reporting Board. The 13,236,000 acres indicated this year is about 2½ percent less than the 13,564,000 acres in 1944 and the lowest since 1941. Although all producing areas report decreases from last year, individual states vary widely. Some of the fringe states, where the crop has not been successful, report rather drastic reductions, while other states with unusually good yields in 1944 intend substantial increases.

War Food Administrator Marvin Jones April 7 urged the necessity of larger soybean production. "It is essential that goals for flax, soybeans and peanuts be fully met," he said. "There is a particularly urgent need for large production of these crops in 1945 to meet domestic and export needs next fall and in 1946."

In North Central states, where over 80 percent of the total "alone" acreage is grown, a decrease of only about 1 percent is expected. Illinois, the heaviest producing state, indicates an increase of 3 percent. A large part of this increase is in the areas of the state hardest hit by the drought and chinch bugs last year, and where soybeans withstood the damage more successfully than corn. The remaining states in the East North Central group all report reductions from last year, ranging from 15 percent in Wisconsin and 10 percent in Ohio, to only 4 percent in Indiana and Michigan.

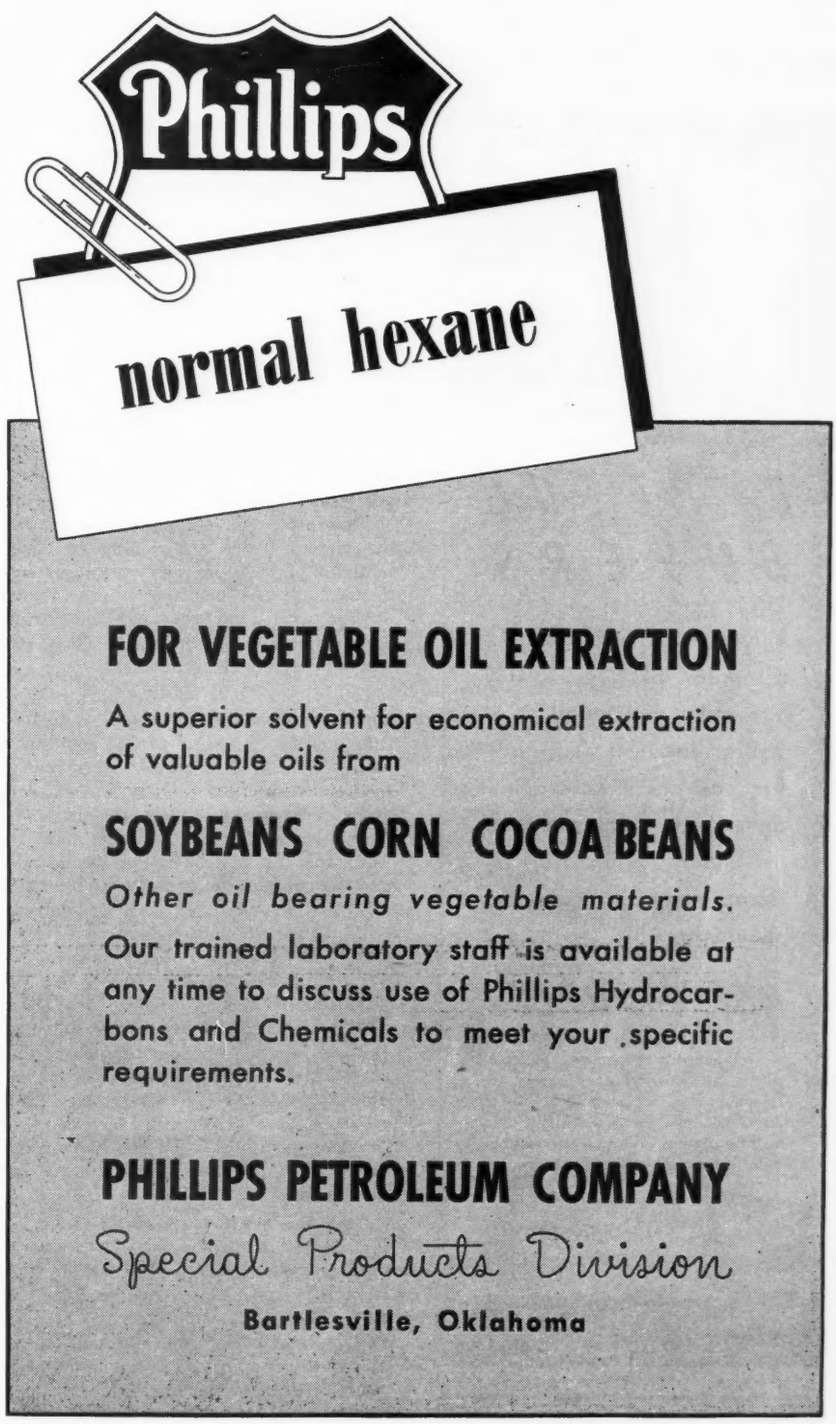
The West North Central states had a very favorable season in 1944 and all states except Iowa report increases in acreage this year. Iowa indicates a reduction of about 7 percent from last year. However, later developments may change this picture materially. If weather conditions do not permit the increase now in prospect for oats, a larger acreage may be planted to soybeans later. In the South Atlantic states, only Virginia indicates an increase over 1944. In the South Central group, Arkansas expects an increase of only 1 percent, with Kentucky and Tennessee reporting no change; the remaining states all indicate decreases from last year.

If about the same proportion of the total acreage is harvested for beans as in 1944, the indicated acreage for beans in 1945 would be about 2 percent less than in 1944, or 10,334,000 acres compared with 10,502,000 acres last year.

SOYBEAN ACREAGE PLANTED 1/

State	Average 1934-43	1944	Indicated 1945	1945 as pct. of 1944
	Thousand Acres			Pct.
New York	15	20	11	55
New Jersey	28	49	35	71
Pennsylvania	66	119	98	82
Ohio	748	1484	1336	90
Indiana	1143	1776	1705	96
Illinois	2713	3857	3973	103
Michigan	112	140	134	96
Wisconsin	166	112	95	85
Minnesota	189	357	446	125
Iowa	1256	2229	2073	93
Missouri	513	750	780	104
North Dak.	——	7	12	171
South Dak. 2/	13	14	22	157
Nebraska	25	30	36	120
Kansas	100	238	262	110
Delaware	46	67	60	90
Maryland	63	94	80	85
Virginia	138	176	181	103
West Virginia	50	39	35	90
N. Carolina	325	361	350	97
S. Carolina	33	35	25	71
Georgia	91	97	84	87
Florida	—	—	—	—
Kentucky	155	194	194	100
Tennessee	177	248	248	100
Alabama	265	290	244	84
Mississippi	328	309	263	85
Arkansas	232	357	360	101
Louisiana	89	85	72	85
Oklahoma	18	17	15	88
Texas	30	13	7	54
U. S.	9120	13,564	13,236	97.6

1/ Grown alone for all purposes. Partly duplicated in hay acreage.
2/ Short-time average.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WHERE TO?

By J. E. JOHNSON

With the outstanding progress made by the lowly soybean during the past 25 years, the birth of the *Soybean Digest*, the official publication of the American Soybean Association, ranks among the highest achievements of the Association; a medium for carrying information of vital importance about soybeans as an industry to the large group of people engaged in what is now a 500 million dollar industry.

Yes, we are justly proud of the *Digest*, however, it is disheartening to see the growth of the subscriptions as slow as they are, even though making gains; it would appear that the indifference or oversight is largely by growers who have profited so widely by this crop, ranking second in value for Cornbelt farms. Think of it, the subscription amounts to less than one bushel of soybeans at present prices. There is so much to learn about the crop for the present and the future; information that is presented in practical, understandable language in each and every issue.

J. E. JOHNSON

What have we learned from the soybean yield contests? Incidentally it is just four years since the writer was given the challenge by the processing industry at the National Farm Chemurgic Council to start action on "greater efficiency in soybean production." Three of the largest soybean producing states have four years of experience and observation that is most valuable.

Looking at Illinois, the high yield for 1944 was 47.78 bushels with an average of 38.18 for all contestants. No, the average yield of the contestants hasn't improved, however it is interesting to note that the highest yields are coming from the southern part of our good bean growing section. Illinois has kept the minimum acreage at 10 the same as used in the corn contests. For our large fields this seems to be the most practical.

Let's look at Indiana which has held its acreage at five the same as its corn acreage contests. A record of 105 contestants with a high of 47.3 bushels. Forty-four of the contestants used the new Lincoln variety with an average yield for the group of 36.6 bushels. This does not have the value that the statement that "wide rows and a light rate of seeding was used that may have reduced the yield to some extent." Then 26 contestants growing Richlands with an average of 33.8 bushels; this is significant for an early variety that certainly has a place in soybean production. This too is valuable as coming from the Indiana report, "row planting gave higher yields than solid drilling; certified seed gave a four-bushel increase; early June plantings gave a two-bushel decrease over the May plantings." Obviously in speaking of May plantings it was for the last half of May.

Then the newcomer, Nebraska, stepping high, wide and handsome with a high of 49.2, a low of 33.8 bushels. Fine work Nebraska, and finer from those agencies that made possible the contest. Speaking of the "newcomers," we must take off our hats to the Southern states where 50 bushel yields are very common. Does it mean that the longer growing period sections will have this advantage when associated with the work of the plant breeder in making selections to meet the conditions? We must constantly keep in mind it is the number of pounds of good quality soybean oil per acre that is the real objective in soybean production.

As usual there is an evidence of overenthusiasm for the Lincoln soybean; a good bean, but still an infant in the field of consistency of performance. This has been the experience of other varieties with the result that many were planted out of their growing altitudes, this year showing a comeback of some varieties that were little grown the past two years. Our results will obviously be most satisfactory when we consider all of the factors that make for production, not just one or anything that strays from the sound and fundamental. We have much to learn. The soybean contests give us some very valuable observations; may we hope for an increased number in 1945.

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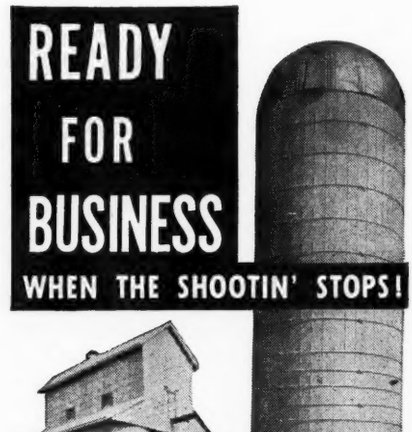

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ALLIED MILLS TO EXPAND RESEARCH

J. B. DEHAVEN

Expansion of present extensive research facilities are being set up by Allied Mills, Inc., according to John B. DeHaven, president of the corporation, who has announced the acquisition of a 220-acre tract near Chillicothe, Ill., where a new research farm is now being established.

"Research demonstrated its value long before the war emergency, but since Pearl Harbor the amazing results of agricultural and industrial research have been so evident that no one can doubt the important part that research will play in all postwar readjustment," states Mr. DeHaven. "Our expansion in this field is dedicated to the purpose of helping American farmers produce livestock and poultry products more efficiently and profitably.

"Not only are we establishing a completely new research farm, but in addition we are enlarging our already extensive research center at Peoria, with the erection of a new research administration building that will house the headquarters of the Allied Mills Research Division and headquarters for our Industrial Engineering Department. Due to constantly expanding research activities, our present location and facilities are inadequate."

Mr. DeHaven announced that the new research farm is ideally located 15 miles north of Peoria, overlooking the beautiful Illinois river. Improvements are now being made and building will be started as soon as materials are available.

Dr. J. E. Hunter, Director of Research, is in charge of all Allied Mills Research activities.

—s b d—

CALLAND

(Continued from page 9)

continue into postwar times? If so, what will be the price relationship between soybeans and other farm crops? How soon will we be plagued with depressing surpluses of corn and wheat?

These briefly are some of the things that will have a lot to do with the future of soybeans.

Of some things we can be fairly certain. We shall probably have plenty of soybeans as long as the present price relationship with other grain crops is maintained. Also, there is no question but that new products are being developed, some of them may even be more important than the products now produced. Research programs are being carried out in dozens of laboratories over the country. From these we can expect many new chemurgic developments which taken together will require many million bushels of beans.

Moreover, soybean oil meal will go into the postwar period with a widespread acceptance as one of the finest and most versatile protein concentrates available. Its value as a feed has been so completely proved that its place in the feed industry is firmly established.

The place of soy oil in the food industry, where at present it occupies such a strong position, may not be too secure with the return of a surplus of competing fats and oils, both animal and vegetable However, it appears that soy oil has a wide future in industrial fields. By means of fractionating processes soy oil can now be separated into two oils. One, an exceptionally fine edible oil, the other, excellent for use in paints and varnishes. Both of these portions may be worth much more than the original oil.

To me, it looks like little decline if any, in soybean production for the next two years.

Maybe there is nothing gained by sticking my neck out farther than that. But, I have plenty of faith in the future for soybeans. It is a far cry from the 13 million bushel crop of 10 years before to the 200 million bushel crop of last year — from processing 3 million bushels to processing 50 times that many. The soybean has been called the mircale plant and the day of miracles wrought by science is not over — it is just beginning.

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★ PUBLICATIONS ★

VALUE OF SOYBEAN MEAL PREPARED FROM DAMAGED (BIN-BURNED) SOYBEANS AS A FEED FOR GROWING SWINE, by J. L. Krider, assistant chief in swine husbandry, B. W. Fairbanks, chief in swine husbandry, and W. E. Carroll, head, Department of Animal Husbandry, Illinois Agricultural Experiment Station.

In Illinois during the spring and summer of 1942, many soybeans came out of storage in a badly damaged or "bin-burned" condition caused by an excess moisture. A sample of soybean oil meal was prepared by the expeller method from some of these damaged soybeans for comparison with normal expeller soybean oil meal prepared from mature soybeans that appeared sound after storage. The soybeans from which the bin-burned oil meal used in this test was prepared were described as "average 75 to 80 percent damaged." At the Illinois station in the fall of 1942, a study was made of the feeding value of the bin-burned soybean oil meal in comparison with normal expeller soybean oil meal for growing-fattening pigs in dry lot.

The method used consisted of feeding the pigs by the paired feeding technique for equal gains in order to obtain quantitative results. The writers believe this is the first time that paired feeding for equal gains has been attempted with swine. One pig of each pair received the check ration which contained normal soybean meal, while the other pig was fed the ration which contained bin-burned soybean meal.

The pigs were paired on the basis of weight, litter, sex, breed, type, condition, and probable outcome. Ten pairs of pigs were fed. They were purebred Chester Whites, Duroc Jerseys, Hampshires, and Poland Chinas raised on the University farm. Their weights varied from 28 to 80 pounds at the beginning of the test. The youngest pairs were 51 to 56 days old when the test began.

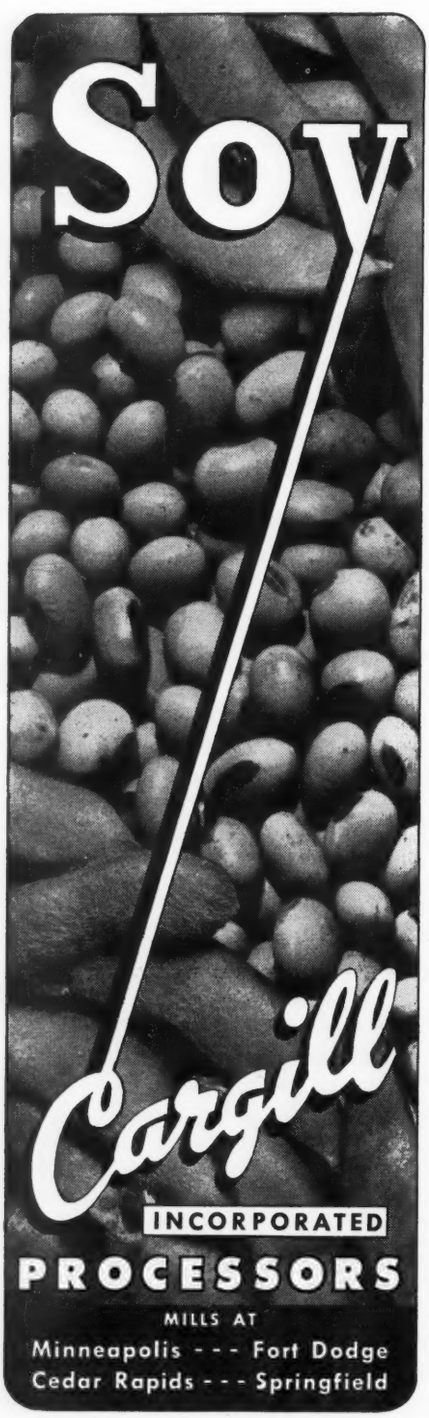
When a feed mixture of ground yellow corn, normal expeller soybean oil meal, alfalfa meal, steamed bonemeal, limestone, and sodium chloride was compared with a similar feed mixture in which expeller soybean oil meal prepared from bin-burned soybeans was fed to growing pigs in place of normal soybean oil meal, both mixtures were consumed readily.

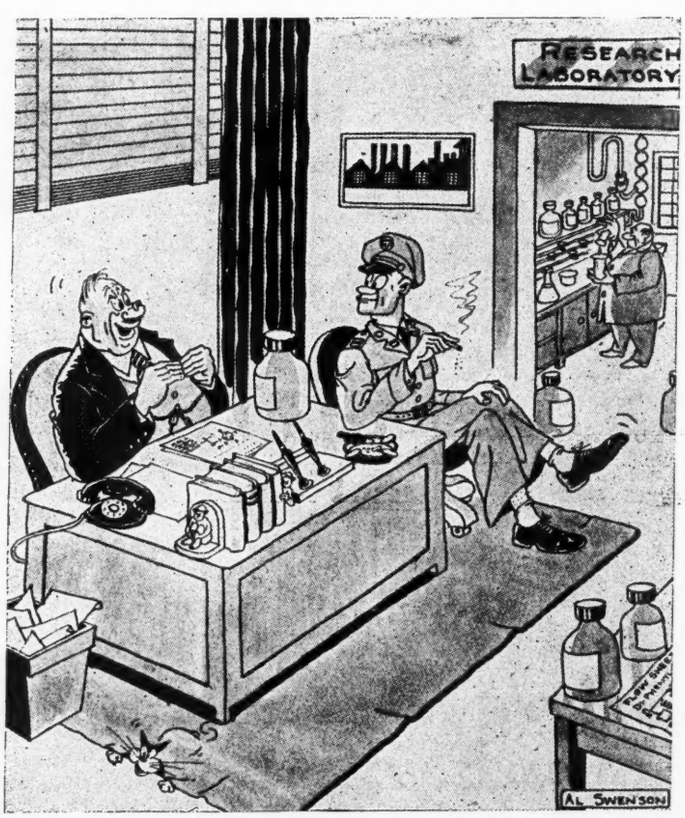
In five pairs of pigs, the check mate made more economical gains as measured by feed eaten per pound of gain. In four pairs, the mate fed bin-burned soybean oil meal gained more economically, while in one pair the economy of gains was the same.

These results are too nearly a chance distribution to indicate any statistically significant differences in the feeding value of the two feed mixtures. From these data, it may therefore be concluded that the soybean oil meal prepared from the damaged soybeans was equal in feeding value to the soybean meal prepared from sound soybeans for growing-fattening pigs in dry lot.

—s b d—

Close row spacing of soybeans gives highest yields of best quality soybeans. While 24- to 30-inch rows have been found to give the best returns, most of the present farm equipment can't handle rows that close together, points out E. S. Dyas, Iowa State College agronomist. Many growers follow the practice of planting alternate 36- and 24-inch rows. The planter is set at 36 inches and the marker at 24.





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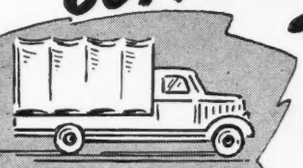

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★ GRITS AND FLAKES ★

FROM THE INDUSTRY

A serious chinch bug threat to the 1945 Illinois corn crop is forecast by H. B. Petty, associate in entomology extension of the University of Illinois. "If at all possible, fields should be so arranged that a minimum amount of small grain will be planted next to corn," Petty suggests. "Clovers and soybeans will not support an infestation of chinch bugs, so one of these fields between corn and small grains will help in preventing some barrier construction in June." In 1944 many farmers forgot chinch bugs, and cornfields were in many cases nearly surrounded by small grain fields, which is contrary to recommended practices.

The Texas Cottonseed Crushers Association has established a soybean transit service under the direction of James D. Dawson, Jr., of Fort Worth. The department handles the intricacies of freight rate tariffs, many of them extremely complicated, and railroad transit circulars applying on northern soybeans shipped to Texas processing plants, and the reshipping of the cake and oil meal. Over 100 mills have taken advantage of the service. Last year Commodity Credit Corporation furnished the necessary information concerning operation of transit on soybeans, but this service was discontinued with the closing of the Dallas office of CCC.

J. J. Skinner, senior biochemist with the Agriculture Department, Bureau of Plant Industry, Soils and Agricultural Engineering at Beltsville, Md., has retired after 41 years of government service. Dr. Skinner was appointed a scientist in the Bureau of Soils in 1904, and became senior biochemist in the Bureau of Plant Industry in 1935. In 1919 he was awarded the Longstreth Medal by Franklin University for his work in biochemistry, and in 1930, he received the Chilean Nitrate of Soda $1,000 Award for studies on fertilizer nitrogen. He now plans to live on his 1,200-acre estate near Hertford, N. C., and raise hogs and essential war crops such as *soybeans* and *peanuts*.

Fred Udell, Kansas City plant manager of the Ralston Purina Co., has been named president of the Denver Alfalfa Milling and Products company of Lamar, Colo. Udell will assume his new post May 1. Udell has been affiliated with the Ralston Purina company for 29 years, a good part of which time he has spent with the production and buying departments. He is a former member of the Kansas City Board of Trade and the St. Louis Merchants Exchange. John C. Skaggs, assistant manager of Ralston company at Kansas City, will assume the position held by Udell.

E. D. Funk, Jr. has been named president of the Funk Bros. Seed Co., Bloomington, Ill., to succeed his father, the late E. D. Funk, Sr. Paul Funk was elected to fill the vacancy on the board of directors caused by the death of Mr. Funk, last November. J. R. Holbert, vice president and general manager, continues in that capacity as do all other department and division heads. The other two Funk brothers, Lafayette and Theodore, are secretary and treasurer, respectively, of the company.

"Adventures in Business," an organization which weekly honors an outstanding American firm, selected Pillsbury Mills for its salute recently. Pillsbury is the first—and only—milling company to be so honored. "Adventures in Business" issues a four-page weekly publication devoted entirely to its honored firm, syndicates a newspaper column about it, and arranges window displays featuring the company.

More than half of soybean acreages fail to meet the requirements for certification, even among growers who make a special effort to produce seed of quality for certification, reports Joe L. Robinson, Iowa State College extension farm crops specialist who handles most of the certification arrangements in Iowa.

Colorado House Bill 557, which exempts margarine made of soybean oil from the 10 cent per pound excise tax imposed by that state, passed both houses of the Colorado legislature in March. A similar bill became law in Kansas in February.

Cancellation of the 36th Annual Meeting of the American Oil Chemists' Society which was to have been held in New Orleans May 9 to 11 has been announced by Dr. Klare S. Markley, president of the society. This action was taken in order to cooperate with the Office of Defense Transportation.

Coffee Shop department of *Hotel Monthly* for March features an interesting article on "Using Soy Flours in Basic Sweet Doughs" by Homer W. Kuehn, research baker of Central Soya Co., Inc.

PATENTS AND TRADE-MARKS

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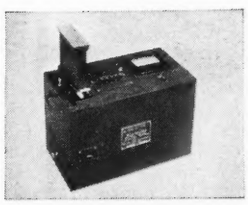

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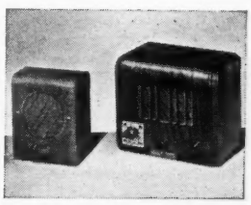

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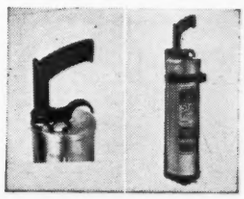

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Shoots about 30 feet straight and continuously. Turn handle a half turn either way, pump a few strokes and pull the trigger . . . not necessary to pump while shooting and pressure can be stored up for short periods. The liquid contains no water, alkali, or acid, and will not freeze. It is a non-conductor of electricity, and will not harm delicate silks, high polishes, etc. Price—1 Qt. $9.30, 1½ Qt. $11.30. Refill liquid $.95 Qt., $3.15 Gal.

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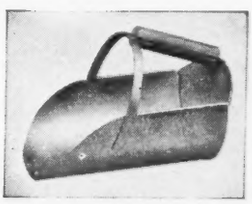

HANDY SCOOP

This handy scoop is made of blue planished steel. The handle, centered instead of at the end, distributes the weight evenly and makes the handling of materials easier and handier. It is available in four different sizes, 8 in. length $1.35, 10 in. length $1.50, 12 in. length $1.75, 14 in. length $2.25. This scoop is in great demand in the grain and seed trades.

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WASHINGTON Digest

Fats Short 21 Percent

The first public glimpse at official, though incomplete, figures on the supplies and requirements of fats and oils for 1945 was given early this month in War Food Administration testimony before the Senate food investigating committee.

Lt. Col. Ralph Olmstead, vice-president of Commodity Credit Corporation in charge of the Office of Supply, told the committee:

"Present estimates of the total supply of fats and oils (excluding butter) available to the United Nations in 1945 fall short by about 3,469 million pounds, or 21 percent, of equalling estimated requirements.

"The deficit will be larger if it is not possible to make all transfers from one place to another, and all substitutions of one oil for another, that are necessary in order to use all available supplies to meet firm requirements.

"Even if U. S. civilian food requirements should be cut to the unprecedentedly low level of 40 pounds per capita," Olmstead went on, "and the largest non-food uses are kept to 10 to 30 percent below the 1944 quotas, it will not be possible to meet liberated area requirements in full.

"This is true for all types of oils, lard, edible vegetable oils, lauric acid oils, linseed oil, and tallow, although the deficit is somewhat more pronounced in lard and linseed than in the other groups.

"It is possible that some additional supplies may be made available — such as fats from the Balkans for U.S.S.R., linseed oil from Argentina, and copra from the Philippines — but these sources cannot be counted upon at this time."

The WFA official cited production figures indicating that output of fats and oils, including butter and lard, had been increased from an average of 7,240 million pounds during the 1935-'39 period, to 10,867 million pounds in 1944, and 9,808 million pounds in 1945.

"Thus, while production has greatly increased during the war," he said, "both military and civilian needs for fats and oils throughout the world have increased to a much greater extent."

Olmstead gave this picture of fats and oils supplies:

"Lard production is expected to be at least 850 million pounds below 1944 in the United States, and close to 40 million pounds lower in Canada. A reduction in production of flaxseed in three of the four principal sources available to the United Nations is expected to reduce the supply of linseed oil about 1,300 million pounds below 1944 — a decline of 53 percent.

"In Argentina, linseed oil is being burned as fuel. Unless fuel oil is exported to them, no flaxseed can be expected from that source to meet the need for drying oils. The War Food Administration has been urging for months that this step be taken. No copra supplies from the Philippines have been included in the estimates. It is anticipated that supplies of other fats and oils will be approximately the same as in 1944."

OPA announced the April allocation of margarine for *civilians* at 40,800,000 pounds, compared with a March allocation of 51,600,000 pounds.

By PORTER M. HEDGE
Washington Correspondent for The Soybean Digest

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The Soybean Industry

to bring their grinding problems to us. Our many years experience in the grinding field have given us a fund of knowledge that can be useful in helping to solve your grinding problems.

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Patents Pending

W-W GRINDER CORP.
DEPT SB — WICHITA, KANSAS

For shortening and oils, the April allocation to civilians is 162,000,000 pounds, against 167,400,000 pounds during March.

Ration point values for lard, shortening and cooking oils are increased from 4 to 6 points a pound, and the point value of margarine is up from 5 to 8 points a pound.

War Food Administration's requirements and allocations committee has worked for weeks to get agreement on the second quarter fats and oils allocation.

A special food subcommittee of the recently organized export control committee headed by Foreign Economic Administrator Leo Crowley also has been working on the problem.

Members of this committee are: J. B. Hutson, agricultural deputy to the War Mobilization and Reconversion Director, chairman; D. A. Fitzgerald of WFA; H. W. Parisius of FEA; Courtney Brown of the State Department; Major General Hardigg of the Army; and Captain Baker of the Navy.

In the sense of deciding how U. S. food supplies are to be divided up among civilian, armed services, and foreign relief claimants, Hutson is in one of the most influential food positions in Washington.

The tight supply of fats and oils is one of the food "shortages" the House committee, headed by Representative Anderson of New Mexico, intends to look into during its investigation of the food situation.

Representative Anderson told *The Digest* his committee planned first to get all the indisputable data available before holding open hearings. The committee plans first to look into the meat shortage, then go into other commodities, particularly fats and oils, and sugar.

Other members of the committee are Congressman Pace of Georgia, Clements of Kentucky, Gorski of Illinois, Andresen of Minnesota, Herter of Massachusetts, and Holmes of Washington.

A Drouth This Year? Because of the squeeze on some foods, Washington farm officials are paying closer than usual attention this year to the weather and its possible effects on 1945 farm production.

The question running through many minds is: "Are we about due for another drouth?"

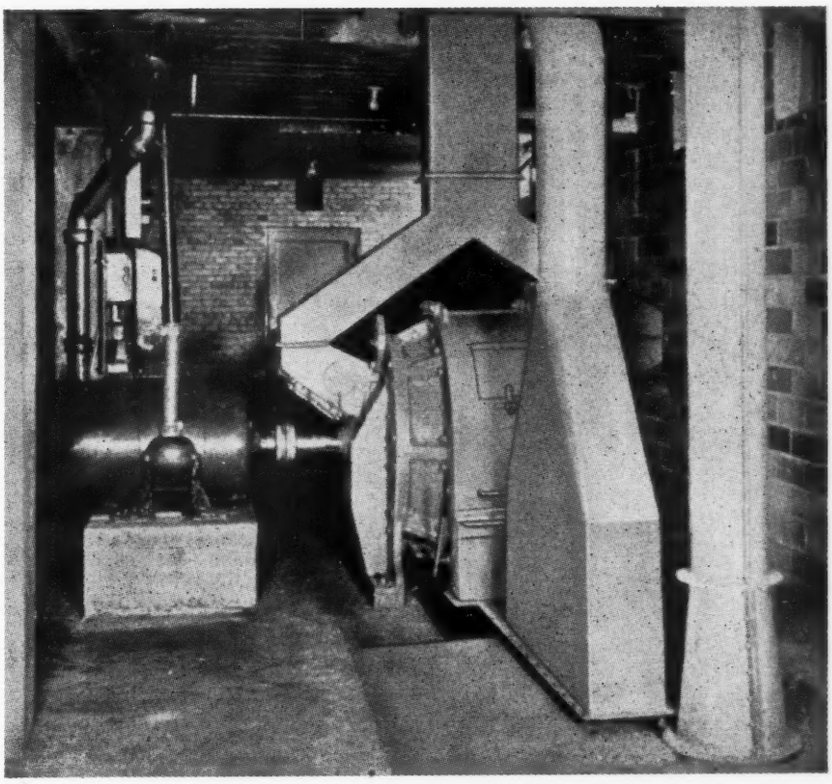
In the southern hemisphere, both Australia and Argentina were hit by drouth during the 1944-45 growing season. Dry weather has cut sugar cane yields in Cuba. What are the chances of drouth hitting the United States next?

The Weather Bureau in Washington can't give a straight yes or no answer, since it involves too much guesswork. But the Bureau does have these facts from which farmers can draw their own conclusions:

The precipitation cycle all during the 1930's ran to slightly drier weather than normal for the country as a whole. Starting in the 1940's, the cycle has run to slightly more moisture than usual.

It would be reasonable to assume that

The PRATER Principle



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the present cycle would continue through 1945, though the cycles do not necessarily run for long periods.

Soil moisture is good throughout most of the country. Winter wheat came through in good shape; range and pasture conditions in most parts of the country were excellent at the first of April. Irrigation water in the west was about up to normal. Chances are that present moisture plus rainfall during the 1945 growing season will see most crops through.

However, the Weather Bureau points out that the weather has a habit of making suckers out of forecasters who stick their necks out. The Weather Bureau hasn't yet found a reliable system for long-range forecasting.

Margarine Battle Hot

Paul T. Truitt, president of the National Association of Margarine Manufacturers, reports that legislative scraps over the margarine taxation issue are under way in Ohio, Vermont and Pennsylvania.

In Ohio, the bill known as "Ohio 252" repealing the state law prohibiting sale of colored margarine has received a hearing before the state Senate committee on Commerce and Labor, and the outcome is uncertain.

In Pennsylvania, probably the "hottest fight of all" is being waged to obtain a 50 percent reduction in fees paid by wholesalers, grocers and others handling margarine.

Margarine interests are opposing in Vermont a bill to repeal the straight $25 retail license on handlers and replace it with a sliding scale license system under which the license would range from a minimum of $2 on dealers handling up to 400 pounds of margarine a year, up to a maximum of $125 for the largest dealers.

Price Ceilings

Price ceilings on the 1945 soybean crop will be announced this year ahead of the planting season, instead of after harvest as heretofore has been the custom.

A price ceiling schedule the same as last year has been agreed on by Office of Price Administration and War Food Administration. Officials want to get the schedule out earlier this year so producers and processors will know what to expect ahead of harvest.

The schedule agreed on calls for a top legal price to producers of the base grade, U. S. No. 2, 14 percent moisture, yellow and green, of $2.10 a bushel. A one-cent premium will be allowed for each one-half percent moisture below 14 percent down to 11 percent.

Ceiling for U. S. No. 2 class III brown, IV black, and V mixed is $1.90 a bushel.

CCC Due for Overhauling

Commodity Credit Corporation, one of War Food Administration's biggest operating units, appears to be headed for another overhauling.

Lt. Col. Ralph Olmstead, CCC vice-president for supply, has been ordered by the army to report for active duty, presumably to become food administrator for Germany.

As *The Digest* went to press, Food Administrator Jones had not decided on a successor to Olmstead. There was a possibility that the two main divisions of CCC — Office of Supply and Office of Basic Commodities — might be pulled closer together under CCC President Frank Hancock. No important changes in personnel dealing with soybean producers and processors were expected.

COMMENT

To the Editor:

Your magazine has stimulated my interest in soybeans.

Am raising certified Lincoln and Earlyana this year. Very few Earlyana in this vicinity. This year we are planting beans before corn. We had good success last year with corn following beans on disked ground.

Lewis Omer,
Carthage, Ill.

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Jay Bee Model W
Direct Connected
60 to 200 H.P.

Give You

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ENDURANCE

FOR hammermill grinding, JAY BEE leads! It's the choice of mill operators who must meet heavy schedules. More JAY BEE's are in feed plants than any other type of mill.

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Emergency conditions prove the sturdy performance of the JAY BEE. Over a quarter of a century mill making experience, that produces the JAY BEE, now pays big dividends to mill operators.

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Jay Bee of Texas, Dallas, Texas
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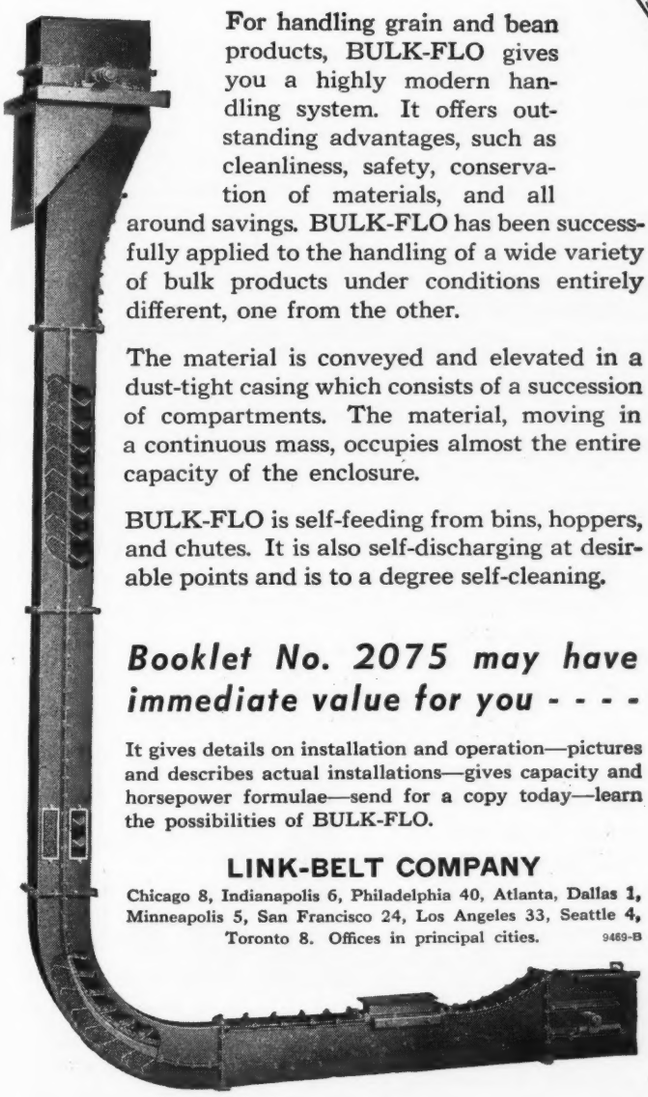

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The material is conveyed and elevated in a dust-tight casing which consists of a succession of compartments. The material, moving in a continuous mass, occupies almost the entire capacity of the enclosure.

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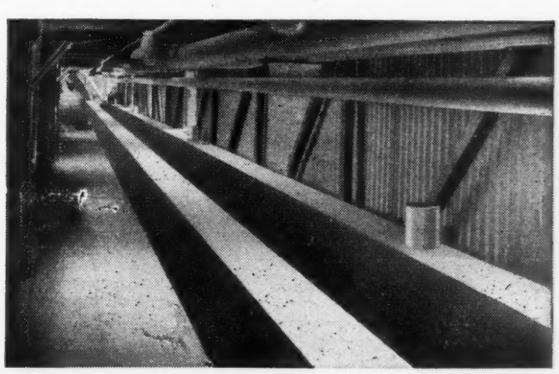

HANDLING SOY BEAN FLAKES. Horizontal runs of four Bulk-Flo units handling raw and spent soy bean flakes shown above. Horizontal runs are asbestos covered to retain heat in the product. Dust tight, safe, clean, with high capacity in limited space.

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Uninoculated Soybeans Take Nitrogen From The Land

Uninoculated soybeans may grow on good land by feeding on the land just as does corn. It may cost as much as $10 per acre to replace the nitrogen consumed by one crop of uninoculated soybeans. Take this nitrogen from the air — save up to $10 per acre with **KALO INOCULATION.**

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Neither prior crops or the presence of nodules, can guarantee proper inoculation and there is no assurance that effective strains of bacteria will survive from year to year. **A sure way is to inoculate each crop with Kalo Inoculation — this is good insurance.**

Kalo Inoculation is Highest Quality . . . Costs Less

Kalo inoculants contain superior strains of bacteria . . . carefully selected for their ability to fix nitrogen. Over 500 competitive tests have proven Kalo inoculants to be of top ranking quality. Yet, our price is low — FROZEN there by OPA! You can save and **profit** with Kalo Inoculation.

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3 Cultures in 1 Can
for all clovers, alfalfa
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SOY-GRASS COOKIES—Wheatless, sugarless, alkaline. The food sensation of the age and LAST WORD IN NUTRITION. 3 packages postpaid for $1.00. ViVi-Ta Healthful Foods, 480 E. Main, Rochester, N. Y.

EDIBLE SOYBEANS — Bansei variety, high germination. Quantities up to a car load. Samples to seed firms only. W. C. Martin, Orrville, Ohio.

FOR SALE — Edible soybeans, Bansei's. High germination. 1 to 20 lbs., postage paid, 25c per lb., 20 to 100 lbs., F.O.B. Orrvilie, 15c per lb., 100 lbs. to 100 bu., F.O.B. Orrville, 10c per lb. Cash with order or C.O.D. C.O.D. by parcel post only. No samples. W. C. Martin, Orrville, O.

WANTED — To hear from owner of farm or unimproved land for sale. Wm. Hawley, Baldwin, Wis.

EXPERIENCED OIL REFINER desires change. Centrifuge or kettle method. Shortening, winterizing. Can handle help. Supervisory capacity at present. Reliable. JH, Soybean Digest, Hudson, Iowa.

Seed Directory

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Dell—J. M. Stevens, 5,000 bu. uncertified Ralsoy, 500 bu. uncertified Macoupin.

ILLINOIS

Antioch — Albert Herman, 300 bu. Bansei, 50 bu. Mendota, small quantity Giant Green.
Carthage — Lewis Omer, 90 bu. uncertified Bansei.
Minooka — Dana Cryder, Rt. 2, 400 bu. certified Earlyana, 100 bu. uncertified (edible) Bansei.
Plainfield—John R. Schmidt, 100 bu. edible Willomi and Hokkaido varieties.
San Jose — Kelly Seed Co., 16,000 bu. Illini, 1,200 bu. Dunfield, 6,800 bu. Richland, 1,500 bu. Manchu, 2,800 bu. Chief, 800 bu. Patoka, all uncertified.

INDIANA

Anderson — Roy Scott, Rt. 2, certified Lincoln, sold out.
Clayton — Paul Jackson, Box 25, 700 bu. certified Dunfield.
Evansville — Henry L. Hahn, Rt. 2, 1,500 bu. certified Gibson.
Knightstown — Ray Cannell, Hackleman Farms,, 1,500 bu. certified Chief.
Princeton — Princeton Farms, 4,000 bu. certified Gibson, 2,000 bu. certified Patoka, 1,000 bu. uncertified Macoupin.
Valparaiso — L. K. Wyckoff, Rt. 3, certified Earlyana, certified Richland, Lincoln sold out.
Worthington — H. H. Sloan & Sons, Rt. 1, 2,000 bu. certified Chief.

IOWA

Castana — Fred W. Hawthorn, 1,500 bu. certified blue tag Richland.
Estherville — A. B. Rosenberger, 300 bu. certified Richland, 100 bu. Earlyana from certified seed, 100 bu. Canadian Mandarin from certified seed, 50 bu. uncertified Habaro.
Hudson — Strayer Seed Farms, 1,000 bu. uncertified Richland, 1,000 bu. uncertified Bansei edible, 200 bu. uncertified Sac edible, 30 bu. uncertified Mendota edible.
Laurel — Bert L. Benskin, Box 5, 2,000 bu. certified Lincoln, 4,000 bu. certified Earlyana.
Marshalltown — Kenneth R. Lynk, Rt. 1, 2,400 bu. certified Richland.
New Hartford — Howard B. Good, 500 bu. uncertified Earlyana, 3,000 bu. certified Richland.

MINNESOTA

Montevideo — John W. Evans, 50 bu. 92% germination certified Kabott, 200 bu. 93% uncertified Habaro, 200 bu. 96% uncertified Pridesoy, 50 bu. uncertified Richland, 20 bu. 88% uncertified edible Bansei.

MISSOURI

Bethany — Ben Crouch, 30 bu. uncertified Hokkaido, 10 bu. uncertified Aoda, 20 bu. uncertified Kanro.
Villa Ridge — George Saum, 500 bu. certified Boone.

OHIO

Covington — Raymond Ebberts, Rt. 2, 1,000 bu. certified Richland.
Irwin — Farm Management, Inc., 250 bu. certified Bansei, 2,000 bu. uncertified Bansei.
Marysville — O. M. Scott & Sons Co., 300 bu. uncertified edible Bansei.
Maumee — W. N. Woods, Monclova Rd., 300 bu. registered Richland, 350 bu. uncertified edible Bansei.
Orrville — Harry A. Landis, Rt. 2, 300 bu. edible Bansei. No ships less than 300 lbs.
Worthington—E. S. Halley, 175 bu. uncertified edible Bansei.
West Alexandria — A. B. Flory, 75 bu. registered Lincoln, 200 bu. uncertified Richland.

VIRGINIA

Dunnsville — R. P. Smith, 15 bu. Sac.

WISCONSIN

Madison—Blaney Hybrid Seed Corn Farms, Rt. 3, 2,000 bu. certified Manchu No. 3, 1,000 bu. certified Manchu 606, 500 bu. uncertified Manchu No. 3, 500 bu. uncertified Manchu 606.
Prairie du Sac — Kindschi Bros., 400 bu. certified Manchu 606.

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Non-poisonous to humans or pets

A red squill product made according to U. S. Dept. of Agriculture formulas.

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Also packed in bushel, half bushel, and one-fourth bushel baskets for quantity users. Write for prices.

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Hudson, Iowa

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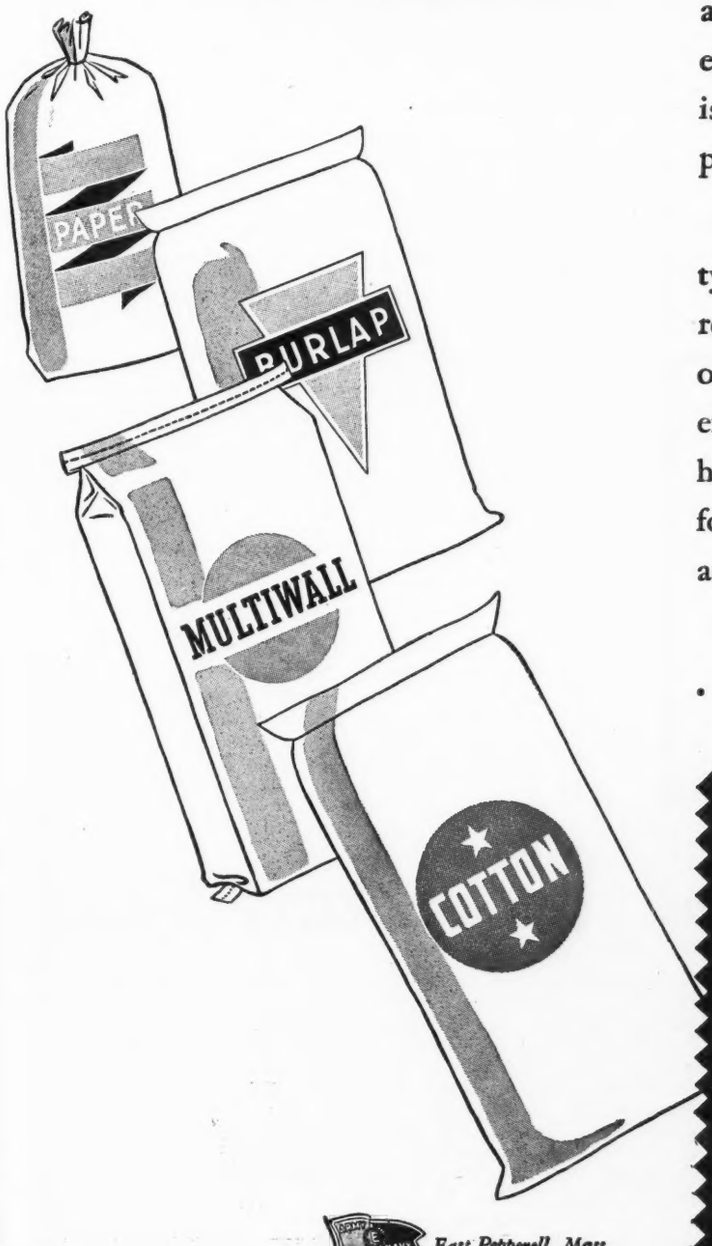

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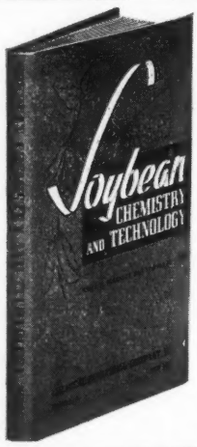

Soybean Chemistry and Technology . . .

by KLARE S. MARKLEY

Principal Chemist, Southern Regional Research Laboratory; Formerly Senior Chemist, U. S. Regional Soybean Industrial Products Laboratory

and WARREN H. GOSS

Senior Chemical Engineer, Northern Regional Research Laboratory; Formerly Senior Chemical Engineer, U. S. Regional Soybean Industrial Products Laboratory.

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In The MARKETS

• FEBRUARY FOOD PURCHASES. WFA's report of agricultural commodities purchased during February for lend-lease. territorial emergency, Red Cross and other purposes.

Deliveries of food and other agricultural products for government supply programs, both domestic and overseas, totaled 933,491,352 pounds in February, an increase of 152,615,409 pounds over January deliveries, and 67,606,496 pounds more than February 1944. Total deliveries so far for 1945 are 1,714,367,295 pounds.

Approximately 79 percent of the total, or 736,035,539 pounds was delivered for shipment to allied nations under the Lend-Lease program.

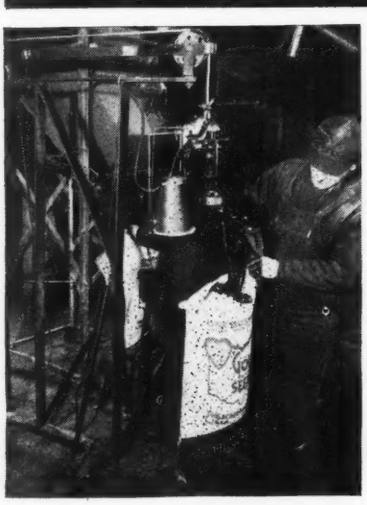
Commodity (Lbs.)	February	Jan. & Feb. 1945
Margarine	7,747,815	12,126,313
Shortening	62,404	111,044
Vegetable Oils	23,234,058	58,065,376
Soybeans	1,999,100	1,999,100
Soy Flour & Grits	2,517,080	6,859,780
Territorial Emergency Program (Hawaii)		
Soybean Meal	170,000	1,409,800
Cash Sales		
Margarine	188,320	1,018,541
Salad Dressing	17,955	17,955
Shortening	588,312	1,333,896
Vegetable Oils	58,630	62,610
Soybean Oil Meal		60,000
Soy Flour	670,000	673,500
Soy Grits	128,500	128,500

• SOYBEAN STOCKS. War Food Administration commercial grain stock report.

U. S. Soybeans in Store and Afloat at Domestic Markets (1000 bu.)

Market Groups	Mar. 6	Mar. 13	Mar. 20	Mar. 27	Apr. 3
Atlantic Coast	404	396	383	403	487
Gulf Coast	116	289	295	402	479
Northwestern and Upper Lake	682	682	625	624	602
Lower Lake	6,720	6,596	6,290	5,703	5,485
East Central	6,619	6,220	6,033	5,601	5,298
West Central, Southwestern & Western	4,859	5,002	4,556	4,317	4,171
Total Current Week	19,400	19,185	18,181	17,050	16,522
Total Year Ago	16,696	15,683	14,558	13,589	12,790
U. S. Bonded Soybeans in Store and Afloat at Canadian Markets					
Total Current Week	33	1	0	0	0
Total Year Ago	16	16	22	16	11
Total North American Commercial Soybean Stocks					
Current Week	19,186		18,181	17,050	16,522
Year Ago	15,699		14,580	13,605	12,801

• SOYBEAN INSPECTIONS. Inspected receipts of soybeans continued light in February with a total of 2,367 cars compared with 2,613 cars in January, according to inspectors' reports to the Grain Products Branch of the War Food Administration. Inspected receipts for October-February this season were 58,152 cars compared with 65,030 cars for the same period the preceding year.



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The Union Special Suspended Head Utility Unit is an ideal machine for bag closing work. Efficient, inexpensive, economical and easy to operate, it handles production or serves as a standby unit. Class 80600 enclosed, heavy duty sewing heads or Class 14500 heads for light and medium duty work, are available to close paper or fabric bags of all sizes. Machines have fingertip control clutch and automatic brake. Heads are suspended by cable over tandem pulleys with counter weight or from a Thor Top Lock Balancer. Can be used with overhead rail suspensions, over checkweighing scales, with remote counterbalance suspensions or in other specialized ways. Write for Bulletin No. 200. UNION SPECIAL MACHINE COMPANY, 476 North Franklin Street, Chicago 10, Illinois.

Union Special *Bag Closing Machines*

The quality of the soybeans inspected in February was slightly lower than in January, 83 percent grading No. 2 or better compared with 87 percent the preceding month.

Inspections of soybeans in February included the equivalent of 45 cars inspected as cargo lots, and truck receipts equivalent to about 24 cars.

● STANDARD SHORTENING SHIPMENTS. By members of Institute of Shortening Mfgrs., Inc.

Week ending March 10, lbs.	7,425,870
Week ending March 17	7,834,675
Week ending March 23	7,207,582
Week ending March 31	10,452,860

● CANADIAN PRODUCTION. Canadian soybean production in 1944 was 682,000 bushels, reports *Foreign Crops and Markets*. This compares to 569,000 bushels in 1943 and 925,000 bushels in 1942. Average production for 1937-41 for Canada was 206,000 bushels.

Government Orders

● CANADIAN CEILING. A ceiling price of $2.15 per bushel for No. 1 and No. 2 Canada soybeans, delivered at Toronto, Winnipeg, Lethbridge or Vancouver was announced by the foods administration of the Wartime Prices and Trade Board.

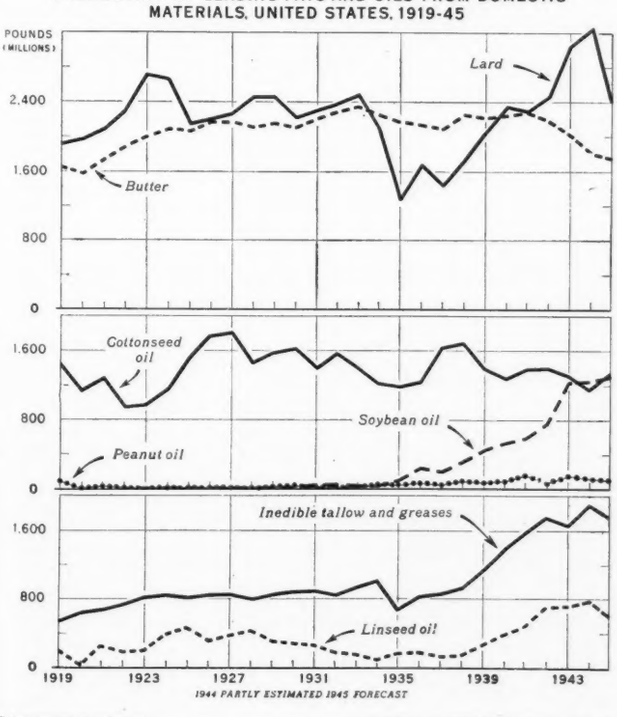
The new order is designed, foods officials said, to ensure normal marketing practices.

Ceiling price for No. 3 grade is $2.12 per bushel, for No. 4 grade $2.08, and for any other soybeans $2 per bushel, all delivered at the four basic points. Prices at other than these centers will vary according to transportation charges. The maximum prices apply to all sales except those between primary producers.

● SOYBEAN CEILINGS. Ceiling prices that may be established at the beginning of the 1945 crop year for raw, unprocessed soybeans are announced by the Office of Price Administration.

The proposed prices, which are listed in a notice to growers, are:

PRODUCTION OF LEADING FATS AND OILS FROM DOMESTIC MATERIALS, UNITED STATES, 1919-45



U. S. DEPARTMENT OF AGRICULTURE — NEG. 43423 — BUREAU OF AGRICULTURAL ECONOMICS

Now Ready...

Important Report on Use of Spergon to Improve Soybean Stands and Yields

Seeking a practical method of preventing seed decay caused by soil-borne and seed-surface fungi, a number of agriculture experiment stations have been investigating the value of chemical treatments for soybeans.

Spergon Seed Protectant is one of the materials that has been tested, and a report on the tests of Spergon is now ready for free distribution to all persons interested in improving soybean stands and yields.

In some experiments covered in this report the benefit from Spergon treatment was pronounced, especially when applied to commercial seed of low viability.

Send for your complimentary copy of this report today. Diseases of soybean seed are gaining a greater foothold every year; prompt action is necessary if they are to be kept under control.

Advantages of Spergon

- **Protects seed against decay caused by soil-borne and seed-surface fungi.**
- **Safe to use. Non-poisonous and non-irritating to those applying it to seed.**
- **Long lasting. Spergon does not deteriorate with age. May be applied months in advance of planting.**
- **Self-lubricating. No graphite needed in planter.**
- **Compatible with legume inoculants.**

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It really sticks! Ideally suited for patching, mending or repairing clothing, tents, awnings, grain bags, sacks, burlap bags, flour mill silks, canvas, leather goods and many other materials. A thousand uses in home, farm and shop.

EASY TO USE — Just spread a thin coating with a paddle or knife, press pieces firmly together and allow to dry. Will not peel or tear off.

WATERPROOF — Can be washed without loosening the patches. Available in conveniently sized containers. Write for trade prices.

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OWENSBORO GRAIN CO.

Owensboro, Ky.

Processors of Soybeans

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Greendale Soybean Meal

U. S. No. 2, Classes I (yellow) and II (green) — $2.10 per bushel of 60 pound.

U. S. No. 2, Classes III (brown), IV (black) and V (mixed) —$1.90 per bushel.

The notice announcing the proposed maximum prices stipulates that the prices may be subject to the same differentials for grade and quality as provided in the regulation for sales of soybeans of the 1944 crop.

The proposed ceilings will not apply to any sale of soybeans to be used as seed for planting in 1946 or to soybeans specially cleaned for use in the production of any products for human consumption not involving the extraction of soybean oil.

OPA explained that the notice is being given growers in compliance with a provision of the Stabilization Extension Act that growers should be notified of maximum prices for annual crops 15 days in advance of planting time.

• PRICE ORDER. The regulation governing maximum prices of soybean products has been revised so that processors may take a mark-up of $3 per ton (or 15 cents per 100 pounds) on sales of soybean meal in quantities of 2,000 pounds or less, the Office of Price Administration announces.

Before the amendment (effective March 17) a processor could not add a mark-up for these small retail sales unless the meal had been unloaded at a warehouse or store operated by him as a place of business separate from the processing plant.

It has been normal trade practice, OPA said, for such a processor to add a mark-up on retail sales made from the processing plant. This mark-up was generally in line with mark-ups of other retail dealers in the vicinity of the processor's plant.

A provision similar to that provided by the amendment for soybean processors has been in effect with respect to cottonseed products for some time, OPA added.

The action also sets out more specifically the shipping points to which it was intended that the carlot flat rate on grain products, rather than on soybean oil meal, should apply in figuring freight allowance from Decatur, Ill.

(Amendment 2 to Supplement 3 to Food Price Regulation 3—Soybean Products—effective March 17, 1945.)

• EDIBLE OIL ORDER. Increased government requirements for products in which vegetable oils are used have made it necessary for the War Food Administration to amend War Food Order No. 42 to reduce the manufacturers' fats and oils quota for shortening, and to make adjustments in provisions of the order relating to the manufacture of margarine.

The amendment, effective April 1, reduces from 88 to 85 percent (of average use in 1940 and 1941) the quantity of fats and oils which may be used in the manufacture of shortening, cooking and salad oils for civilian consumption. Despite this decrease, however, approximately the same quantity of these products will be available to civilians in April, May and June as during the same months last year. This is because manufacturers, who adjust production to consumer demand, did not use fats and oils in the second quarter of last year to the limit of their permitted quotas.